



# FLIGHT

*The*  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS



First Aero Weekly in the World  
 Founder and Editor: STANLEY SPOONER  
 A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport  
 OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 571 (No. 49, Vol. XI.)

DECEMBER 4, 1919

[Weekly. Price 6d  
 Post Free, 7d.]

## Flight

*The Aircraft Engineer and Airships*

Editorial Office: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.  
 Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828.  
 Annual Subscription Rates, Post Free:  
 United Kingdom .. 28s. 2d. Abroad... .. 33s. 6d.\*  
 These rates are subject to any alteration found necessary under abnormal conditions

\*European subscriptions must be remitted in British currency.

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### DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

Dec. 19 to... Paris Aero Show.  
 Jan. 4, 1920.  
 July, 1920 S.B.A.C. International Aero Exhibition at Olympia 1920  
 June 1 ... Air Ministry Competition (Small Type Aero-planes)  
 Aug. 1 ... Air Ministry Competition (Seaplanes)  
 Sept. 1 ... Air Ministry Competition (Large Type Aero-planes)

## EDITORIAL COMMENT



HAVING resigned his position as Under-Secretary of State for Air for reasons which most right-thinking people fully agree with and endorse, Gen. Seely is pursuing the subject of the Government's air policy with considerable pertinacity and skill. He gave private notice of a question to the Prime Minister recently, asking: "Whether the air policy

of the Government in relation to the Air Ministry is the same as it was on November 14, 1917, when the present Lord Privy Seal stated that the whole of the Air Service must be independent of either the Admiralty or the Army Council; why the Secretary of State for War is now President of both the Army Council and the Air Council; and whether the Air Council is now independent of, or depended upon, the President of the Army Council."

Mr. Lloyd George fenced with the question, and said that the air policy of the Government was the same as when Gen. Seely accepted the position from which he recently resigned. The Army Council, he said, had absolutely no control over the Air Force. Lord Hugh Cecil aptly interpolated that it was not independent of the *President* of the Army Council, which is, after all, the point now at issue. The Prime Minister's answer is most certainly far from satisfactory. To put it plainly, it is begging the question absolutely, and while we should hesitate to say that it was intended to be deliberately misleading, it was undoubtedly calculated to lead the unthinking off on a false trail. How on earth *can* the Air Force be completely independent of the Army Council when it is subject to the President of that Council? The answer is too perfectly obvious to be missed—the Air Force and the Air Ministry are in the position of being merely departments of the War Office. We do not doubt either the ability or the *bona fides* of the present Secretary of State. To do so would be to ignore altogether his unquestionably great services to the State.

But we do take exception to the duality of office, which must of necessity mean that either the War Office or the Air Ministry must suffer in consequence of his being unable to allot sufficient time to the services of both. Nor can there be any two opinions as to which it is that is suffering. When we regard the fact that at the Air Ministry there seems to be an utter absence of policy, due to the want of a strong guiding hand, and then look at the War Office, where there is every indication of a vigorous policy at work, we are forced to the conclusion that Mr. Churchill finds that the work of Whitehall occupies all his energies while that of Kingsway has to go by default.

# Following It Up

Having failed to obtain satisfaction from the Prime Minister through question and answer in the Commons, Gen. Seely has followed on with a long, temperate, and well-reasoned letter to the *Times*. In this he recalls the speeches made in both Houses at the time of the introduction of the Air Force Bill in November, 1917. Possibly the most telling of the extracts from these speeches quoted by Gen. Seely is one from that delivered by Lord Curzon, then as now the Leader of the Government in the House of Lords. What he said was this :—

"The noble and learned viscount, Lord Haldane, made another observation which was perfectly true. I will give in substance what he said. He told us that this is not only a War measure but a post-War measure, too. Nothing could be more true than that remark. Astonished as we all have been by the scale and magnitude of the development of air service in the war, it ought by no means to be supposed that that development will cease with the War. On the contrary, every one of us knows that there are futures which lie before the Air Service—into which I need not enter to-night—which will render it not only for years to come, but permanently, a necessary part of what I may call our Imperial organisation. This Air Ministry is not wanted for France, Flanders, Salonika or the East only, but it is required as a part of the material and mechanical resources of the country."

In the Commons Lord Birkenhead, then Attorney-General, said :—

"It is the spirit and object of this Bill that the Air Service shall be recognised as an entirely distinguishable service, that those who are responsible for it shall form a new and important Department answerable to Parliament and responsible for the service for which it so answers to Parliament, and with complete control unfettered by any other service over all those who belong to it."

In some respects this is even more definite than Lord Curzon's very clear exposition of the purposes of the Bill. The Air Force was to be constituted as an "entirely distinguishable Service . . . with complete control unfettered by any other service over all those who belong to it." How does the existing arrangement whereby a single Secretary of State administers the War Office and the Air Ministry square with these statements and protestations? Not at all, so far as the plain person is able to discern. As Gen. Seely proceeds to point out, in the face of all this the Prime Minister endorses a plan by which the air is placed under the Secretary for War. As he says, not only is this proceeding contrary to the decision of Parliament, but it is in itself a fantastic arrangement. No man can possibly be a responsible Minister at the head of two wholly independent Services. One must be subordinate to the other, and the work of one or both must suffer. In view of the facts, the Prime Minister's statement that our air policy remains unchanged is inexplicable to the plain man, for it is clearly at variance with the facts. To make such a statement at all, says Gen. Seely, is to trifle with the House of Commons and the country. *Wherein we entirely agree, though it may be pointed out that trifling with Parliament and the country by the present Prime Minister and his colleagues seems to be quite a usual thing. For cynical disregard of the wishes of the country and its elected representatives we doubt if there has ever been in constitutional history an administration to equal the present.*

Gen. Seely argues that there are three possible alternatives which lie before the Government, one of which they must accept. They must either :—

1. Abolish the Air Ministry and again divide up the Air Force between the Navy and the Army, and hand over the immense possibilities of civil aviation to some existing Government Department.

2. Create a Ministry of Defence, to which the Ministers of Land, Sea, and Air should be responsible.

3. Free the air entirely from control by the head of another Department.

Unquestionably Gen. Seely is right when he says that the first plan would be resisted to the utmost by all who care for our future position in the air. The second would have the immense advantage of securing a proper co-ordination of our War efforts, but must take long to achieve. The third is to abide by the decision of Parliament and the declarations of Ministers. He concludes : "If the Prime Minister and his colleagues do not abide by the statements then made (November, 1917), Parliament and the country have a right to be informed what reasons they can give for a reversal of the policy which they then announced as being vital to the safety and well-being of our country and our Empire."

## How to Get It

We need hardly say we are most heartily in agreement, all along the line, with Gen. Seely. It is unthinkable that we can go back to the bad old system of the two separate Air Services. That, as he says, would be resisted to the utmost by all who have concerned themselves with air policy. We are beginning to think that this is really what the Government have in mind, in spite of half-hearted assertions that there is no change in policy. If that is not the case, we really cannot see why there should be so much objection to the appointment of a separate Secretary of State to the Air Ministry. It surely cannot be that economy is at the bottom of it and that the real motive is to save the salary of another Minister. That would be absolutely ridiculous, but on reflection we are not so sure but that it would be in keeping with some of the acts of "economy" which have foolishly pared down the small but essential things, and have at the same time thrown millions down the sewers. Unless it is that, it seems reasonably clear that the Prime Minister has given another "Parliamentary answer" to Gen. Seely's question.

The latter is right when he contends that Parliament and the country have a right to know what is to be done. The question is, How is the Government to be forced into giving the information? The issue can be forced when next year's Air Estimates come before the House, but that is a long time to wait, and in the meantime aviation, civil and military, is languishing, not so much because the vaunted Government "encouragement" is not forthcoming, but because of the manifest want of policy to which we have more than once called attention in the pages of *FLIGHT*. It is true the Premier said that if it was the general desire of the House to have a discussion on the subject the Government would find time, and this would seem to offer the necessary opening. But he did not say *when* the Government would find the time, and it is time that is the very essence of the contract. The whole movement of aviation wants to know, demands to know, what the policy of the Government is to be. The Air Force, being a fighting Service, is inarticulate, but we do know that it is as



## Flight—And the Men



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Mr. J. D. NORTH, Manager and Chief Designer, Messrs. Boulton and Paul, Aviation Department

anxious to know what the future holds for it as is the civilian side.

All those who value the prestige of Parliament are resentful at the cavalier way in which the House is treated by the Government, and if, for no other reason than that, want to know exactly what is meant by the many conflicting changes of front.

And the country at large, having been treated two years ago to a heated controversy on the respective desirability of one Air Service or two, and having heard and seen what was done and the reasons therefor, is now profoundly disquieted by the spectacle of Ministers going back on their protestations and pretending at the same time that they have done nothing of the sort.

We sincerely trust that the air party in the House will take the earliest possible opportunity of pressing for a full discussion of the whole subject.

**Commercial Airships**

We understand that very shortly a concrete scheme is to be put forward for the approval of the Government in connection with commercial airships. This is the outcome of the conference held some months ago at Australia House between Gen. Seely, representing the Air Ministry, and the heads of certain of the big shipping and armaments interests. It is, we believe, the intention, if the plans are approved—as there is little doubt they will be—of starting experimental airship services early in the coming year. To a great extent these will probably be more in the nature of propaganda services than by way of a real commercial attempt to make such services pay. Those who are behind the movement take the very sound view that

before commercial success can be assured the travelling public must be educated up to the safety, reliability and punctuality of the big airship. They are therefore content to feel their way for the first year, at the same time carrying out this very necessary work of education.

Later, they naturally intend to make a serious bid for a substantial proportion of the traffic eastwards to Egypt and India, and as they are certain that airships can be run as a paying proposition on fares that will compete with the steamship lines, they are sanguine of success. For our own part, the Eastern routes appear to have so much in favour of success for the airship lines, that we have no hesitation in subscribing to the belief held by those who intend to pioneer the services. We foresee the time, and that before very long, when the voyage between England and India will be performed without a stop in five days.

There is absolutely no reason why this should not be done by the bigger rigids, and that it will be done there is no room to doubt. What this would mean to Anglo-Indians coming home on short leave scarcely needs pointing out—it would mean an extra month in England as compared with the steamer routes. Then, assuming that the airship lines would secure at least a portion of the mail contracts, the additional facilities such lines would afford to the transaction of business would be almost incalculable.

But we are anticipating. It will, we understand, be now only a matter of a week or two before an authoritative pronouncement is made, and we shall then be able to speak with more certainty of the future of these projected services.

## AERODROMES AND LANDING GROUNDS

THE Air Ministry announces that the following lists of aerodromes are issued as an addition to or amendment of the lists already published:—

LIST A.—Service stations only available for Civil use in emergency

AMENDMENTS

The following aerodromes have been transferred to List E, and are now published in that list:—

Aerodrome	Nearest Railway Station	Nearest Large Town
Tangmore .. ..	Drayton .. ..	Chichester.
Tresco (S) .. ..	Penzance .. ..	St. Mary's.

References (S) Seaplane station.

LIST C.—Aerodromes temporarily retained for Service Purposes

AMENDMENTS

The following aerodromes have been transferred to List E, and are now published in that list:—

Aerodrome	Nearest Railway Station	Nearest Large Town
Collinstown .. ..	Portmarnock .. ..	Dublin
Crail .. ..	Crail .. ..	Crail
Ford Junction .. ..	Ford Junction .. ..	Arundel
Gullane .. ..	Gullane .. ..	North Berwick
Helperby .. ..	Brafferton .. ..	Ripon
Lincoln .. ..	Lincoln .. ..	Lincoln
Port Meadow (Oxford) .. ..	Oxford .. ..	Oxford
Tadcaster .. ..	Thorner .. ..	Tadcaster
Throwley .. ..	Charing .. ..	Faversham
Upper Heyford .. ..	Lower Heyford .. ..	Bicester
Whitley Abbey .. ..	Coventry .. ..	Coventry
Witney .. ..	Witney .. ..	Oxford

LIST D.—Aerodromes licensed as "Suitable for Avro (504 K) and similar types of Aircraft" only. Except in very few instances accommodation does not exist. The licences have also in the majority of cases been issued for limited periods only.

Aerodrome	Location	Nearest Town
Ipswich .. ..	Priory Heath .. ..	Ipswich
Kidderminster .. ..	Somerleyton Avenue	Kidderminster
West Timperley .. ..	Lies to N.W. of Timperley	Altrincham

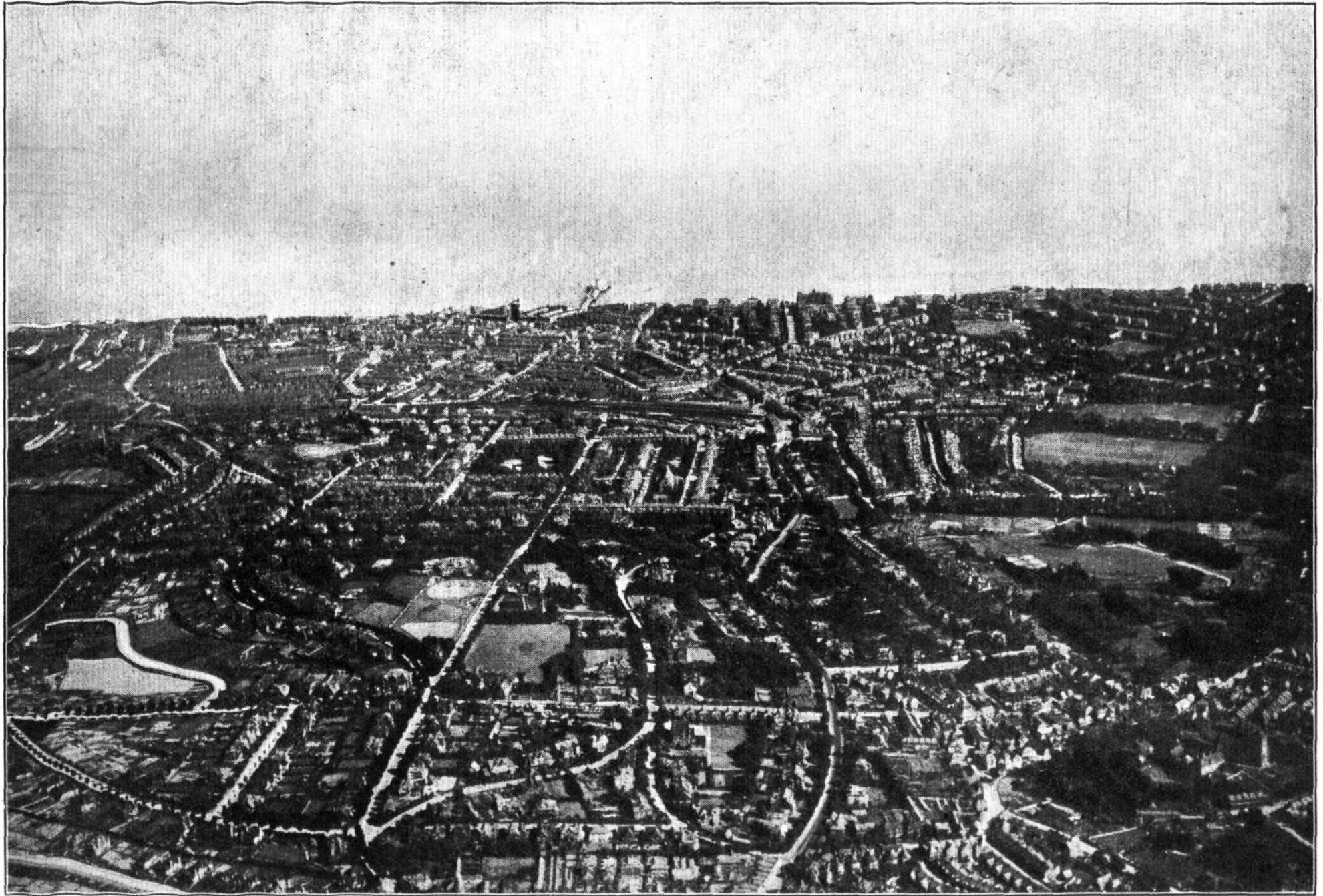
LIST E.—Stations no longer in use by the R.A.F.

These stations have been passed to the Government Property Disposal Board. They will be relinquished as soon as the Government property thereon has been disposed of. In many cases the aerodromes are now under cultivation, but it is probable that the sites still form the best emergency landing grounds in the immediate neighbourhood.

Aerodrome	Nearest Station	Nearest Town
Anglesey (A) .. ..	Llangefni .. ..	Holyhead
Collinstown .. ..	Portmarnock .. ..	Dublin
Crail .. ..	Crail .. ..	Crail
Ford Junction .. ..	Ford Junction .. ..	Arundel
Gullane .. ..	Gullane .. ..	North Berwick
Helperby .. ..	Brafferton .. ..	Ripon
Hythe .. ..	Hythe .. ..	Hythe
Lincoln .. ..	Lincoln .. ..	Lincoln
Port Meadow (Oxford) .. ..	Oxford .. ..	Oxford
Tadcaster .. ..	Thorner .. ..	Tadcaster
Tangmere .. ..	Drayton .. ..	Chichester
Throwley .. ..	Charing .. ..	Faversham
Tresco (S) .. ..	Penzance .. ..	St. Mary's.
Upper Heyford .. ..	Lower Heyford .. ..	Bicester
Whitley Abbey .. ..	Coventry .. ..	Coventry
Witney .. ..	Witney .. ..	Oxford

References—(A) Airship station. (S) Seaplane station.





Eastbourne as seen from the hinterland, from an Avro 'plane, showing the "set-out" of this beautiful seaside town

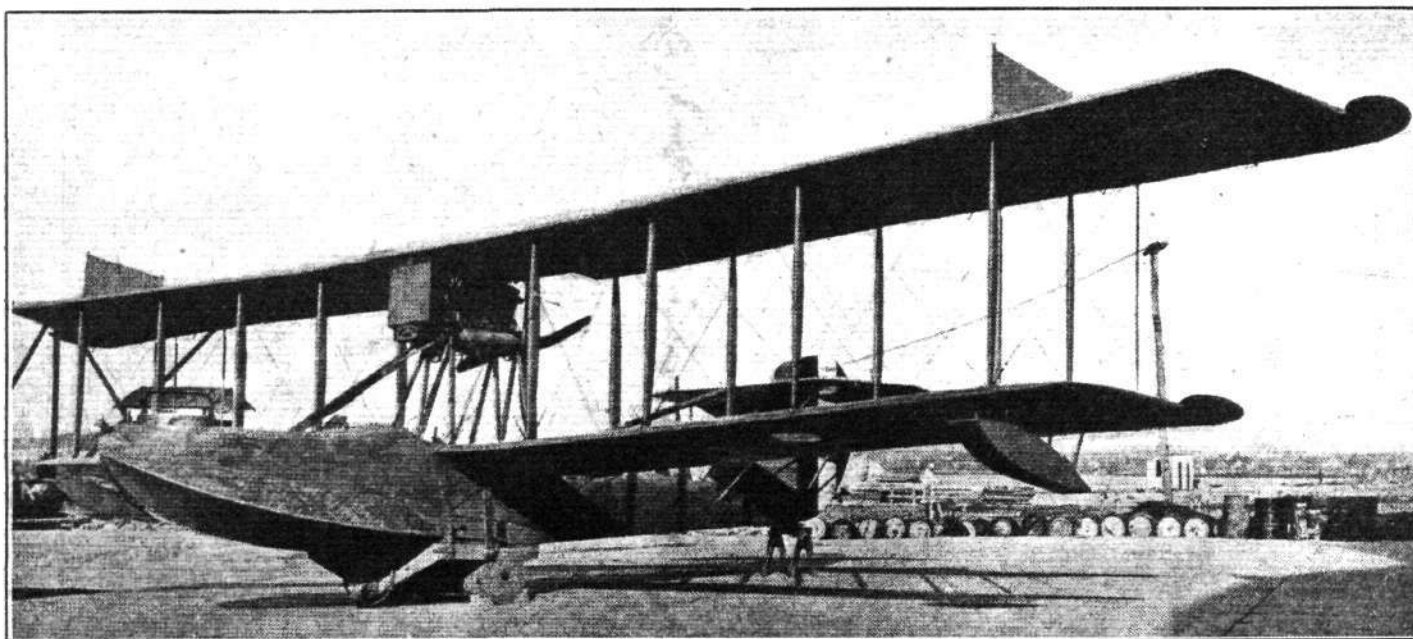
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# THE U.S. NAVY HS-1L AND HS-2L FLYING-BOATS

A VERY successful type of flying-boat for coastal patrol work was put into quantity production by the United States Navy during the War, the Curtiss Aeroplane and Motor Corporation and the Standard Aero Corporation turning out most of the machines between them. There are two models of this flying-boat, the HS-1L and the HS-2L, but the only difference between them is that the latter model is 12 ft. greater in span than the 1L, and has a larger rudder. Apart from this and minor details, therefore, both models are identical, so that the following description and illustrations of the HS-2L apply equally to the other model. The additional wing

sections. (6) Larger size rudder, having 26.5 sq. ft. area instead of 19.6 sq. ft. (7) Aileron control cables lengthened.

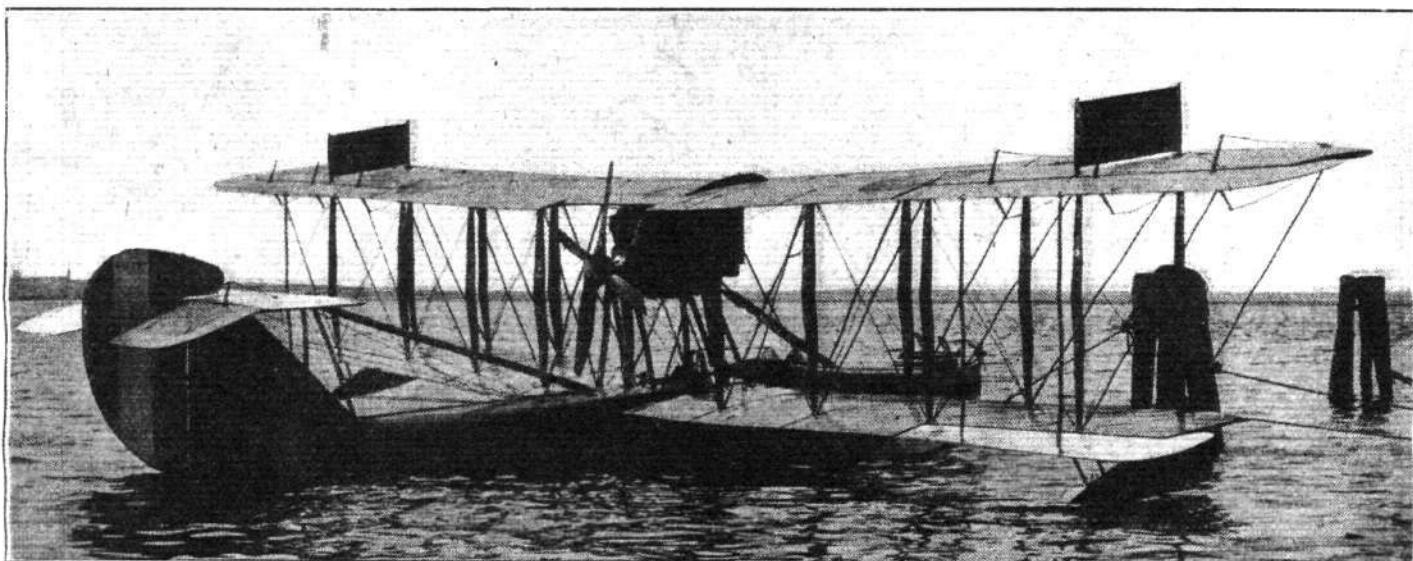
The main planes, which have neither stagger nor sweep-back, have the R.A.F. No. 6 wing section, and comprise a centre or engine section, the lower panels of which being divided by the hull and attached to small "sidewalk" panels built integral with the hull; 24 ft. outer extensions, which in the case of the 1L are mounted direct to the centre section; and, in the L2, 6 ft. intermediate sections. The centre section surfaces are "straight," but the outer sections are set at a dihedral angle of 2°. Balanced ailerons are fitted



Three-quarter front view of the U.S. Navy HS-2L flying-boat

surface of the HS-2L is obtained by inserting a 6-ft. panel between each outer extension and the centre section. All the other parts—except, of course, the rudder—required to convert the 1L to the 2L are duplicates of other parts already on the former model, and the following is a list of the parts and alterations required in converting the 1L to 2L:—(1) Four 6-ft. panels, complete with hinges, and standard HS-1L wing-post fittings. (2) Upper centre section panel, with unrouted spars. [These are routed in the 1L.] (3) Front centre section lift wires changed from two  $\frac{3}{16}$ -in. to two  $\frac{1}{4}$ -in. non-flexible cable, and rear lift wires from two  $\frac{3}{16}$ -in. to two  $\frac{7}{8}$ -in. non-flexible cable. (4) Two 7-ft. front interplane struts  $2\frac{5}{8}$  by  $6\frac{5}{8}$  ins., and two 7-ft. rear  $2\frac{3}{4}$  by  $5\frac{1}{2}$  ins. (5) Four  $\frac{1}{8}$ -in. stagger wires, with turnbuckles and end con-

to both upper and lower planes, the upper ailerons having a maximum chord of 2 ft. 2 ins., and span of 17 ft. 8½ ins., whilst the lower ones have a maximum chord of 1 ft. 10 ins. and a span of 12 ft. 9 ins. The main spars are spaced 4 ft. apart, the front spar being located 9 ins. from the leading edge. The fabric is sewn to the wings with the seams laid diagonally or normal to the leading edge. It is doped with two coats of cellulose acetate, two to four coats of cellulose nitrate, two coats of anti-actinic grey wing enamel on the top and vertical surfaces, and one coat of the latter on the under surfaces. All the strut fittings are of steel stampings and forgings, the main spars are of spruce, and the trailing edges of flattened steel tubing. The compression ribs are of solid pine, and the intermediate ribs of lightened pine.



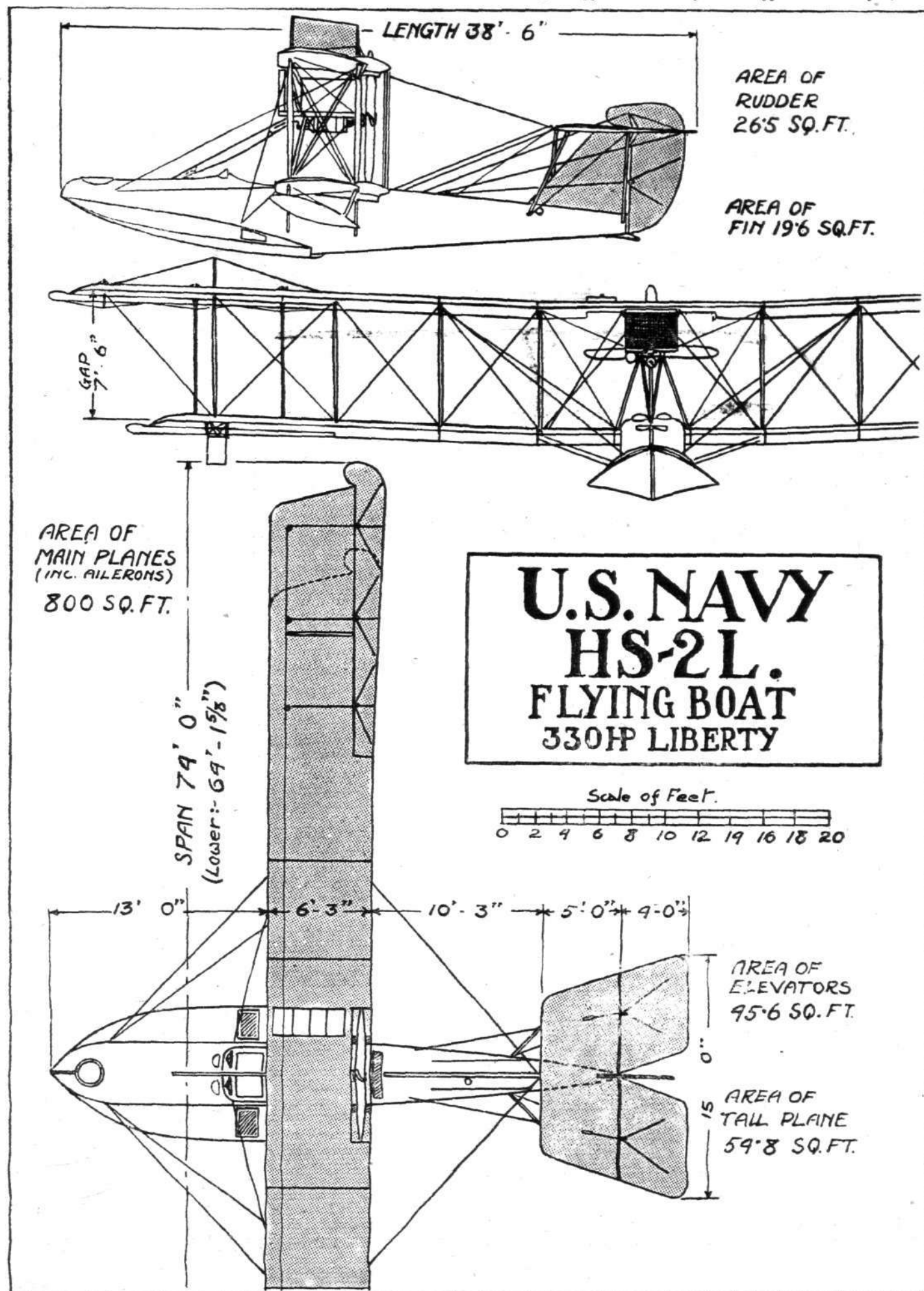
Three-quarter rear view of the U.S. Navy HS-2L flying-boat



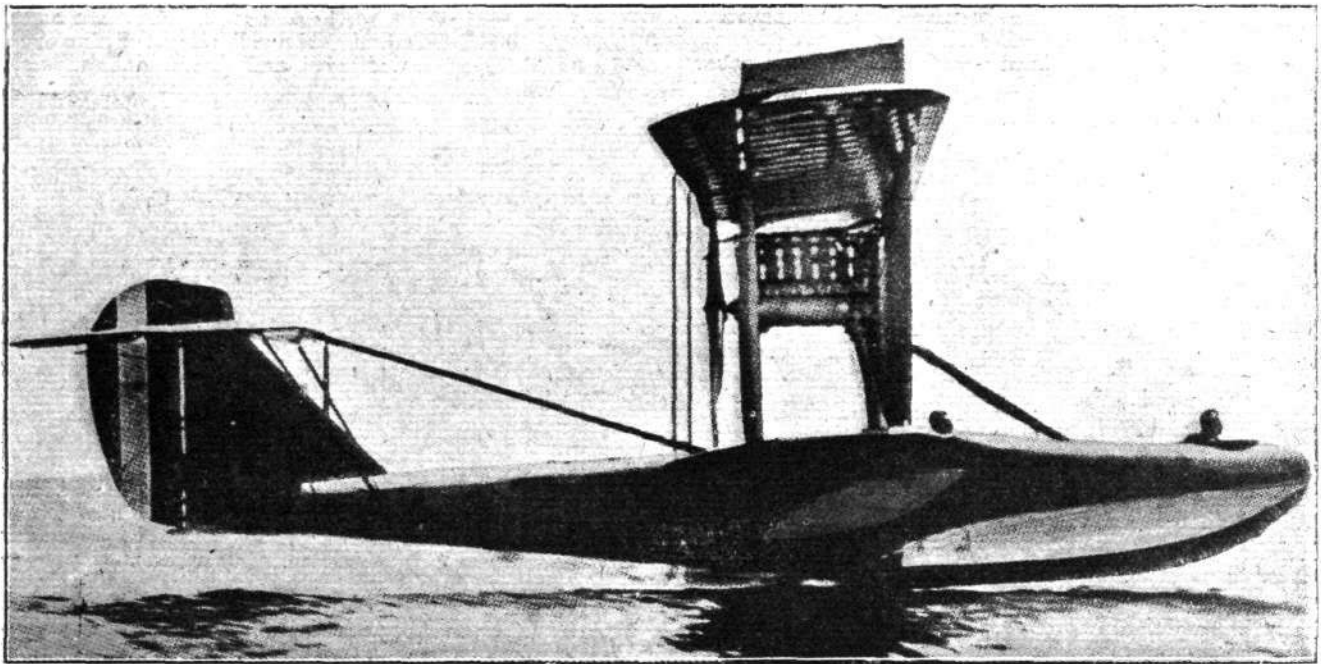
The tail is of the non-lifting type, mounted high up on the stern above the fin. The elevators are divided and unbalanced, whilst the rudder is balanced.

The hull is similar in form and construction to the other

flying boats of the H-12 and F-5L type. It has an overall length of 34 ft. 5 ins., a width of 4 ft. for the main body and 8 ft. across the planing fins. The planking is of pine or cedar, made up of  $\frac{3}{16}$ -in. outer layer and  $\frac{5}{8}$ -in. inner layer, with



THE U.S. NAVY HS-2L FLYING-BOAT : Plan, side and front elevations to scale



Side view of the U.S. Navy HS-2L flying-boat

fabric in between. The frames, keel and stern post are of ash, whilst the keelson, deck stringers and floors are of pine or cedar. The chine stringers are also of pine, or Port Orford cedar, and the seam strips are Spanish cedar. The bulkheads are of three-ply waterproof veneer. The hull itself is finished with low visibility grey wing enamel, and all metal parts are enamelled.

The power plant consists of a single twelve-cylindrical, low-compression Navy type Liberty, developing 330 h.p. at 1,700 r.p.m., and driving a four-bladed pusher screw. The engine is carried on laminated ash-spruce-ash bearers mounted above the hull on streamlined steel tubing, braced with non-flexible tension cables. The main fuel tanks, having a capacity of from 110 to 125 galls., are located in the hull at the centre of gravity, a gravity tank of about 30 galls. capacity being mounted on the top plane centre section.

Dual control is fitted, consisting of an inverted U ash frame equipped with two 16-in. hand-control (*aileron*) wheels. The rudder-bars are of ash, mounted on bronze blocks. The throttle and ignition levers are located in the cockpit, on a diagonal bridge between the two seats.

All bracing cables are galvanised, non-flexible. The centre-section and intermediate cables in the rL are  $\frac{3}{16}$  in., the outer cables being  $\frac{3}{8}$  in. All flying cables are doubled.

The following is a general specification of the HS-1L, and, in brackets, HS-2L:—

Span, upper .. ..	62 ft. 0 ins. (74 ft. 0 ins.)
Span, lower .. ..	52 ft. 1 $\frac{1}{8}$ in. (64 ft. 1 $\frac{1}{8}$ in.)
Chord .. ..	6 ft. 3 ins.
Gap .. ..	7 ft. 6 ins.
Overall length .. ..	38 ft. 6 ins.

Height.. ..	14 ft. 7 $\frac{1}{2}$ ins.
Angle of incidence, upper ..	5 $\frac{1}{2}$ °
Angle of incidence, lower ..	4°
Dihedral .. ..	2°
Area, main planes—	
Upper .. ..	307 sq. ft. (380 sq. ft.)
Lower .. ..	241 sq. ft. (315 sq. ft.)
Ailerons .. ..	105 sq. ft.
Total surface .. ..	653 sq. ft. (800 sq. ft.)
Area of tail plane .. ..	54.8 sq. ft.
Area of elevators .. ..	45.6 sq. ft.
Area of fin .. ..	19.6 sq. ft.
Area of rudder .. ..	19.6 sq. ft. (26.5 sq. ft.)
Area of non-skid .. ..	16 sq. ft.
Weights, rL—	
Hull (including sockage) ..	1,265 lbs.
Wings, tail, bracing, etc. ..	1,400 lbs.
Engine and equipment ..	1,336 lbs.
Ordnance equipment ..	560 lbs.
Electrical equipment ..	53 lbs.
Navigation equipment ..	32 lbs.
Crew and fuel .. ..	1,090 lbs.
Accessories .. ..	52 lbs.
Miscellaneous .. ..	112 lbs.
Total weight .. ..	5,900 lbs.
Total weight, HS-2L ..	6,223 lbs.
Useful load, HS-2L ..	1,864 lbs.
Loading per sq. ft. ..	9.03 (7.77)
Loading per h.p. ..	17.9 (18.85)
Maximum speed .. ..	91 m.p.h.
Minimum speed .. ..	53 m.p.h. (55 m.p.h.)
Climb, 500 ft./3 mins. (1,800 ft./10 mins.)	

#### Prince Albert Enters the Craft

UPON the occasion, on Tuesday last, of the initiation into Freemasonry, Navy Lodge No. 2,612, at Princes' Galleries, Piccadilly, Prince Albert was presented as "Lieut. H.R.H. Prince Albert Frederick Arthur George, K.G., R.N. (Flight-Lieut., R.A.F.)," and his equerry, who was received into the Order at the same Lodge the same evening, as "Surgeon Lieut.-Comdr. Louis Greig, M.V.O., R.N. (Wing-Comdr., R.A.F.)."

#### Future of the Air Ministry

MAJOR-GENERAL SEELY and Lord Hugh Cecil have put down the following motion for an early day in the House of Commons:—

"That it is inexpedient that the same person should hold the two offices of Secretary of State for War and Secretary of State for Air."

Lord Montagu of Beaulieu has likewise given notice that he will, on December 10, call attention in the House of Lords to the recent resignation of Major-General Seely, M.P., the

Minister specially in charge of that Ministry, and move for papers.

#### Aviation in the French Chamber

BOTH Capt. Fonck and Capt. Heurteaux, who were successful in the recent elections in France, have made it clear that they do not intend to take part in general politics. They enter the Chamber with the sole aim of making aviation the most important factor in the new order of things, and to ensure that France shall take, and keep, the place which she ought to occupy among other nations in this respect.

#### Airmen Subject to Army Act

AN Order of the Army Council and the Air Council just issued provides that officers and airmen of the Royal Air Force acting with the military forces under or within the Command of the General Officer Commanding-in-Chief the British Army of the Rhine shall in all respects be subject to the Army Act while on active service as if they were officers and airmen attached to the Army.



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## SPECIAL COMMITTEE MEETING

A SPECIAL Meeting of The Committee was held on Wednesday, November 26, 1919, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Lieut.-Col. Spenser D. A. Grey, D.S.O., Squad.-Leader T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., and the Secretary.

**Presentation to Sr. Guido Janello.**—A silver bowl was selected for presentation by the Royal Aero Club to Sr. Guido Janello for his notable flight in the Jacques Schneider Competition at Bournemouth on September 10, 1919.

**British Record.**—The following British Records were granted:—

**Pilot.**—Capt. G. W. Gathergood.

**Machine.**—Airco 9 R (Aircraft Manufacturing Co., Ltd.).

**Motor.**—450 h.p. Napier "Lion" (D. Napier and Sons, Ltd.).

**Date.**—November 15, 1919.

### Distance in a Given Time—Closed Circuit

Time.	Distance.	k.p.h.	m.p.h.
$\frac{1}{4}$ hour ..	57.09 kil. 35.47 miles	228.36	141.89
$\frac{1}{2}$ " ..	115.35 " 71.07 "	230.70	143.35
1 " ..	232.57 " 144.51 "	232.57	144.51
2 " ..	403.13 " 250.49 "	201.56	125.24

### Greatest Speed

Distance.	Time.	k.p.h.	m.p.h.
5 kils.	h. m. s. 0 1 14.85	240.48	149.43

### Speed—Closed Circuit without Alighting

Distance.	Time.	k.p.h.	m.p.h.
5 kils.	h. m. s. 0 1 24 $\frac{1}{2}$	213.77	132.84
10 " ..	0 2 36 $\frac{1}{2}$	230.47	143.21
20 " ..	0 5 25 $\frac{1}{8}$	221.40	137.57
30 " ..	0 8 13 $\frac{1}{2}$	218.97	136.07
40 " ..	0 11 1	217.85	135.37
50 " ..	0 13 9 $\frac{3}{8}$	227.96	141.65
100 " ..	0 26 7 $\frac{4}{5}$	229.62	142.68
150 " ..	0 38 44	232.35	144.38
200 " ..	0 51 37 $\frac{1}{2}$	232.47	144.45
250 " ..	1 4 29	232.61	144.54
300 " ..	1 17 11	233.21	144.91
350 " ..	1 29 50 $\frac{4}{5}$	233.72	145.23
400 " ..	1 42 32	234.07	145.44

**Timekeepers.**—A. V. Ebbelwhite and A. G. Reynolds.

**Official Observers.**—Harold E. Perrin and Capt. J. C. Brooke, D.S.C.

### Distance in a Straight Line without Alighting

Aviator and One Passenger

**Pilot.**—Capt. Sir John Alcock.

**Machine.**—Vickers-Vimy-Rolls (Messrs. Vickers, Ltd.).

**Motor.**—Two 350 h.p. Rolls-Royce Eagle 8 (Messrs. Rolls-Royce, Ltd.).

**Date.**—June 14-15, 1919.

Distance.	Kils.	Miles.
St. John's, Newfoundland, to Clifden, Co. Galway .. ..	3,041	1,890

**Great Britain to Australia Flight.**—The following additional entry was reported:—

Pilot and Navigator.	Crew.	Machine.	Engine.
Lieut. Raymond John Paul Parer, A.F.C.	Lieut. J. C. McIntosh (2nd Pilot)	F.E. 2B	200 h.p. Beardmore.

**Death of M. Deutsch de la Meurthe.**—The death of Monsieur Henry Deutsch de la Meurthe on November 23, 1919, was reported, and it was unanimously resolved that messages of sympathy be sent to Madame Deutsch de la Meurthe and the Aero Club of France.

The Secretary reported that he had arranged with Mr. Pierre Marechal to represent the Royal Aero Club at the funeral.

## THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916)

Administered by the Royal Aero Club

For the benefit of Officers, Non-Commissioned Officers and Men of the ROYAL AIR FORCE who are incapacitated while on duty, and for the widows and dependants of those who are killed or die from injuries or illness contracted while on duty.

### Honorary Treasurer:

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Group Capt. C. R. SAMSON, C.M.G., D.S.O., R.A.F.

### Secretary:

H. E. PERRIN.

### Bankers:

Messrs. BARCLAYS BANK, LTD., 4, Pall Mall East, London, S.W. 1.

### Subscriptions:

	£	s.	d.
Total subscriptions received to Nov. 24, 1919..	16,680	4	7
W. J. Leonard .. ..	5	0	0
Capt. D. E. B. K. Shipwright .. ..	1	1	0
Mrs. Alfred Amos .. ..	0	10	0
Maj.-Gen. The Rt. Hon. J. E. B. Seely, C.B., D.S.O., M.P. .. ..	10	0	0
T. W. H. Mitchell .. ..	100	0	0

Total, December 1, 1919 .. .. 16,796 15 7

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

## W.R.A.F. Old Comrades' Association

ALL officers and other ranks of the W.R.A.F. who are serving, or have served during the War, will be interested to know that a W.R.A.F. Old Comrades' Association has been formed.

At the inaugural meeting held on Saturday, November 29, at 3 p.m., at Birkbeck College, Commandant Dame Gwynne-Vaughan, who was in the chair, was elected president, and late Assistant Commandant Thompson and Chief Section Leader Seale, hon. secretaries. A central committee was also elected to sit in London, and it was also decided to try to form branches of the association all over the country.

It is felt that a great number of friendships were made between women serving in the Corps during the War period and afterwards, and that some opportunity should be afforded for the periodical renewal of these friendships, and it is the object of the Association to do this and to foster, as

far as possible, the *esprit de corps* that existed in those days.

Apart from its social side, the Association proposes to adopt practical means to assist members in obtaining employment; to help those who are in need of assistance, to endeavour to get suitable cases into homes, hospitals, etc., and to make arrangements, during their convalescence, for members who have been ill. Another possible development will be the exchange of hospitality between country members and those living in town.

Such an Association would not only preserve the spirit of comradeship that was one of the most admirable features amongst all ranks of those who served in the W.R.A.F., but should encourage preparedness to help the country in time of need, should such occasion arise.

Those wishing to join or help in the formation of branches should write to the Secretary, W.R.A.F., O.C.A., 5, Red Lion Yard, Waverton Street, W. 1.

# SOME HANDLEY PAGE COMMERCIAL FLYING DATA

AFTER some seven months' experience in running commercial aeroplane services, Messrs. Handley Page, Ltd., have compiled an interesting summary dealing with their experiences during that period, extracts from which are published below.

The machines used are of the famous twin-engined Handley Page type which for three years carried out the British heavy night bombing over enemy territory. The trappings of war have been removed and comfortable cabins for the accommodation of passengers and freight have been substituted.

The records of the Handley Page aeroplanes from the inauguration of civilian aviation on May 1 until November 19 of this year are as follows:—

Total number of passengers carried	..	3,932.
Total amount of freight	.. ..	33,901 lbs.
Mileage flown	.. ..	56,180 miles.

**Royal Passengers.**—This has been accomplished without one serious mishap, and it includes long flights in rain, snow, fog and gales. Amongst the passengers carried have been the King of Greece, the Prince of Wales, the Crown Prince of Roumania, Crown Prince of Sweden, Lord Milner, the Lord Chancellor, Mr. Bonar Law, and the Emir of Faisal.

On the London to Paris daily service from September 2 to November 26 of this year 569 passengers and 10,979 lbs. of freight have been carried, the total distance covered being 29,100 miles.

The people who have been taking advantage of the speedy journey of less than three hours to and from Paris can be roughly divided into three classes. There is the joy rider, who undertakes the aerial tour solely for the interest and thrill it provides. Women constitute a large number of this type of traveller. Then comes the commercial man who desires to visit a trade show, inspect an important exhibition of goods or conduct urgent business, the success of which depends on personal interviews in distant towns with a minimum amount of delay.

Finally the receipts of the passenger-carrying aeroplanes benefit from the patronage of officers or business men who have missed train and boat connection, and cannot reach the Continent at the hour they desire without utilising the speed which aircraft affords. War pilots who still have a craving for flying are among the passengers who travel to and from the Continent by air.

**Women's Dress for Brussels.**—On the London to Brussels air service from September 26 to November 26 of this year, 569 passengers and 21,130 lbs. of freight and mails have been carried over a total distance of 16,630 miles.

Owing to restrictions, it is only during recent weeks that it has been possible to carry freight to Belgium, but since these have been relaxed the demand of the Brussels shopkeepers for ladies' wearing apparel has resulted in quantities of this form of freight being carried by air.

The unique view of the Flanders battlefields, which is enjoyed by travellers on the London-Brussels air service, has resulted in several passengers making the journey in order to view the Ypres salient, the shell-scarred wastes of the Menin Road and Paschendale Ridge.

The freight which has been carried on the London-Paris-Brussels air services ranges from straw hats to razor blades. Ladies' clothing has been carried in large quantities, for fashion quickly adopted the aeroplane as the speediest means of transferring the latest ideas in dress from capital to capital.

A well-known actress had a delicate robe flown from Paris for her use in a new play. Crêpe de Chine tea-gowns, boudoir caps, feathers and furs appear frequently on the transport bills of the company.

Commercial men are using the aeroplane largely for the quick conveyance of samples of goods, or new inventions, to interest Continental buyers. Samples of rice, electrical apparatus, commercial drawings and printing material were amongst the goods which of recent weeks crossed the Channel in the freight holds of the Handley Page aeroplanes.

Consignments of cloth, drapery, carpets and handkerchiefs are being carried to Belgium for sale in the stores of that city and Antwerp. Manufacturers in the North of England are utilising the service for the rapid conveyance of their products to the Continent. To hasten delivery Handley Page commercial machines have been flying from and to Brussels

in pairs, which is the first stage in a future scheme to run daily formations of commercial aeroplanes to carry freight and passengers on the Continental air services.

## Handley Pages Abroad

In addition to the Paris-London and London-Brussels air services, Handley Page machines have done valuable pioneer work abroad by demonstrating the capabilities of aeroplanes for long cross-country journeys. We publish below brief references to some of these flights.

**In South Africa.**—Capt. S. Wood, the representative of Handley Page, Ltd., is in Cape Town preparing to establish an aerial passenger and mail service throughout South Africa, and to that end he is obtaining a number of machines from England. Capt. Wood, who has seen a good deal of service in Europe, stated to a Press representative: "We want to start a daily service between Cape Town, Pretoria, Johannesburg and Durban. The complete journey from Cape Town to Johannesburg, including stoppages at Kimberley, Bloemfontein, and possibly other places, would occupy approximately 13 hours. We should use the well-known Handley Page bombing machines. We are expecting a consignment of machines, and then we shall undertake experiments, air investigations and exhibition flights. It will be our purpose to accustom people to air flights and to convince them of its safety. We shall give exhibitions in Cape Town and other towns."

**In Greece.**—Capt. William Shakespeare, M.C., writes from Athens: "I have the pleasure to report the successful completion of the first civilian trans-Europe flight. I arrived at Athens after the most trying and unpleasant stage of the journey from London. Taking advantage of what seemed to be good weather at Valona, I left in the early morning, and made quite good time under good conditions to Prevesa.

"Shortly afterwards I landed at Tatoi, having done the journey from Valona in 4½ hours. This, I was afterwards told, was a record time. The people—Greek and English flying officers—were very surprised to see us as the weather had been practically impossible all day; in fact, five minutes before we landed an R.A.F. H.P. machine, securely picketed, had been picked up by the wind and blown completely on its back, being a nasty mess of wreckage which was spread out in front of us.

**"Greek King's Three Flights.**—Needless to say after the buffeting I had received, I was greatly relieved to make our final landing; in fact, we were all pleased with ourselves at the successful completion of this long journey, although it had taken longer than we expected. This fact was due to conditions over which neither I nor the mechanics had any control. Altogether, the machine had been out in six whole days' rain. The engines, with the attention they received, stood very well.

"On the day fixed for the inspection by H.M. the King of Greece, the Press turned up in copious numbers. We initiated them into the mysteries of the H.P. and trans-Europe flight.

"I did two flights of Press people over Athens, and all went home very pleased with the machine, the new 'sensation,' and themselves. On these trips we did some pamphlet dropping over the city.

"Saturday, November 1, was a memorable day, for H.M. the King of Greece turned up and inspected the machine. He was greatly interested, and finally I persuaded him to come up for a flight. Since that occasion His Majesty has had two further flights, the last trip being from Athens to Corinth."

**Six Hundred Mile Night Flight in America.**—The four-engine Handley Page aeroplane which was entered for the Atlantic flight is arousing considerable interest amongst American Army and civilian flying experts. The machine, piloted by Maj. H. G. Brackley, flew recently from Parrsboro', Nova Scotia, to Greenport with 12 passengers, covering a distance of 600 miles in 11 hours. Hundreds of Americans waited half the night in the rain for the machine to arrive, the landing ground being illuminated with flares and searchlights similar to those which formed a beacon of welcome for the British airship R 34.

The flight was accomplished in wind, rain, and darkness; which made the task of Admiral Mark Kerr, the navigator, a difficult one. Whilst over New England coast in darkness and torrential rain the many lighthouses along the sea-shore were utilised as guiding landmarks.



# FLIGHT ASPECTS OF SUPERCHARGING

By B. THOMSON, B.Sc., A.C.G.I.

MUCH has been written, more said, and a certain amount of work actually done towards the provision of what is called a supercharger aero engine, but as yet the problem has been dealt with almost wholly from the engine builder's point of view. Aerodynamic scientists of so high a reputation as Mr. Bairstow have touched on the subject so far as to indicate that a gain in aeroplane performance is to be expected, but the average person interested in flight is still left with a somewhat hazy idea as to how much gain may be anticipated and where that gain occurs.

It is proposed to discuss these questions in the following article, leaving aside all technical considerations of the engine, a subject admirably dealt with by Mr. Spencer, of McCook Fields, in the published article of the U.S.A. Bureau of Standards, to which the reader is referred. It is sufficient to note here that the effect of supercharging is to reduce the loss of b.h.p. at high altitudes to a small amount.

The flight aspects of supercharging have been divided into three sections:—

(a) The aeroplane, (b) the propeller, (c) the working conditions. Mathematical symbols have been cut to a minimum and curves used to demonstrate the arguments employed. The figures put forward do not represent any particular machine, but it is thought they show a good average design and reasonable accuracy for the purposes intended.

Before proceeding to these arguments it is necessary to define what is meant by the word efficiency. Given equal reliability, transport efficiency may be written as—

$$\text{Working efficiency} = \frac{\text{Total weight carried}}{\text{Actual tractive effort to keep in motion at speed used.}}$$

For an aeroplane the L/D ratio at which the machine is actually flown.

CURVES ON MACHINES, Figs. 1 to 3.

The first curve to be considered is Fig. 1. It represents an L/D or working efficiency curve for an aeroplane plotted

to a base  $\sqrt{\frac{K_{y_{\max}}}{K_y}}$  corresponding to speed range.

$K_{y_{\max}}$  = maximum lift coefficient = .55.  
 $K_y$  = lift coefficient.

The L/D curve is deduced from the curve given by Capt. Barnwell in his lecture to the Aeronautical Society. Aspect ratio 9 to 1, no stagger and .8 gap/chord ratio. The curve being redrawn to satisfy equation  $L/D = \frac{K_y}{K_x + .015}$  where .015 is an allowance for body resistance.

The machine may be taken to have any surface loading giving any desired landing speed corresponding to the wing section used.

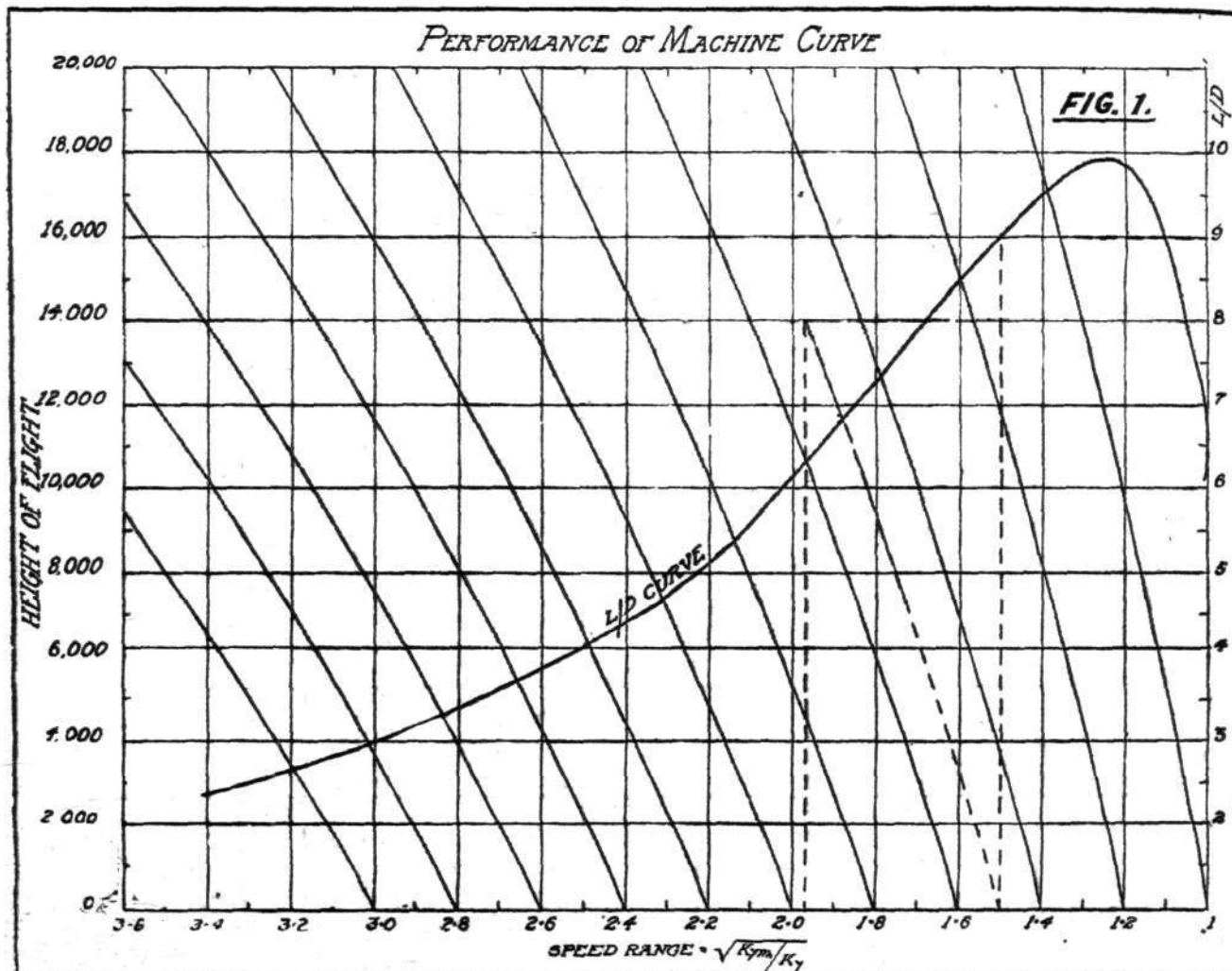
The landing speed is taken as unity and the top speed found by multiplying the landing speed by the speed range. For example—

Speed range, 3.  
 Landing speed, 47.8 m.p.h.  
 Top speed =  $47.8 \times 3$   
 = 143.4 m.p.h.

The value of this curve is the striking way it shows up the loss of efficiency at high speeds in the modern aeroplane. The maximum L/D for the machine shown is 9.9, but the limits imposed by the man, the conditions of aerodromes, and the structural necessities of the machine tie us down to a landing speed that in practice can hardly be allowed to exceed 55 m.p.h., and, if a top speed of 120 m.p.h. is to be obtained, corresponding to a speed range of 2.18, the L/D drops to 5.2, only some 52½ per cent. of the highest efficiency possible.

Now, the practical speed range of an aeroplane may be taken as the multiple of the landing speed at sea-level necessary to give the top speed at the altitude at which the machine is worked.

It is well known that the landing speed increases on aerodromes situated at considerable heights, but very few aerodromes are more than 5,000 ft. up, and at that altitude the increase is only some 10 per cent., so that it is not important



But in connection with supercharging the factor causing the above phenomena is of extreme importance. This is that if a machine be driven through the air at a constant L/D (equivalent to a constant angle of attack) the speed of level flight increases with the altitude inversely proportionally to the square roots of the varying air densities.

To show this increase the writer has superimposed on Fig. 1 a series of curves of the form  $\frac{1}{\sqrt{\rho}} \sqrt{\frac{K_{y_{max}}}{K_y}}$  where  $\rho$  = air density at any height.

A scale of heights of flight has been marked on the left-hand side of the diagram, and from each of the speed range numbers a curve has been drawn proportional to the increase of speed with height when flying at the L/D immediately above the speed range number. To make the above clear it has been assumed that the machine is to be flown at an L/D of 9.0, approximately 90 per cent. of its maximum efficiency. Follow the dotted line from the L/D scale to the point where the L/D curve is cut for the second time, the first cut can be neglected, it merely concerns "getting off," the speed range number immediately below this is 1.5. From 1.5 a dotted curve is interpolated between the speed increase curves running from 1.4 and 1.6 and the curve has been run up to 14,000 ft., corresponding to a speed range of 1.965—see vertical dotted line. What this means is that we can maintain an efficiency of 90 per cent. with a speed range of 1.96 by going to 14,000 ft., but if we try to keep this efficiency at sea-level our speed range is only 1.5, or, conversely, if we are to maintain a speed range of 1.96 and work at sea-level we have to be content with an L/D of 6.3, corresponding to an efficiency of 64 per cent.

Any test pilot knows that the top speed of an aeroplane falls off very little up to some few thousand feet below her ceiling, the air speed indicated falls more rapidly, but that is another matter. The curve shows the reason for this. Take the normal engine and machine made to fly at 1.96 speed range at ground level, her L/D is 6.3, but if she is still flying at the same speed by the time she has reached 14,000 ft. her L/D has become 9.0, the engine loss of power having been balanced by the gain in efficiency of the machine.

In the above respect a supercharger-engined machine is in a very much happier position. If she is flown at a constant L/D her resistance remains the same at any altitude, but her speed increases, and the increase in power required to

drive her is only proportional to this increase of speed. No other vehicle than the aeroplane has this property of being able to increase its speed with an only proportional increase of power.

It is true that as the horse-power provided by a supercharger motor only remains constant or is subject to a slight decrease, the actual gain in top speed at high altitudes will not be so great as the curves appear to indicate, but it will be very considerable.

The following figures are calculated from the curves of Fig. 1:—

	Ordinary engine.	Super-charger.
Landing speed (sea-level)	50 m.p.h.	50 m.p.h.
Top speed, 1.96	98 m.p.h.	98 m.p.h.
Height of flight ..	Sea-level	14,000 ft.
L/D at top speed	6.3	9.0
Resistance per 10,000 lbs.	1,590 lbs.	1,110 lbs.
Propeller h.p. required ..	416	291
Engine h.p. at 70 per cent. propeller efficiency ..	595	415

Summarising the evidence of the curve Fig. 1, we see that:—

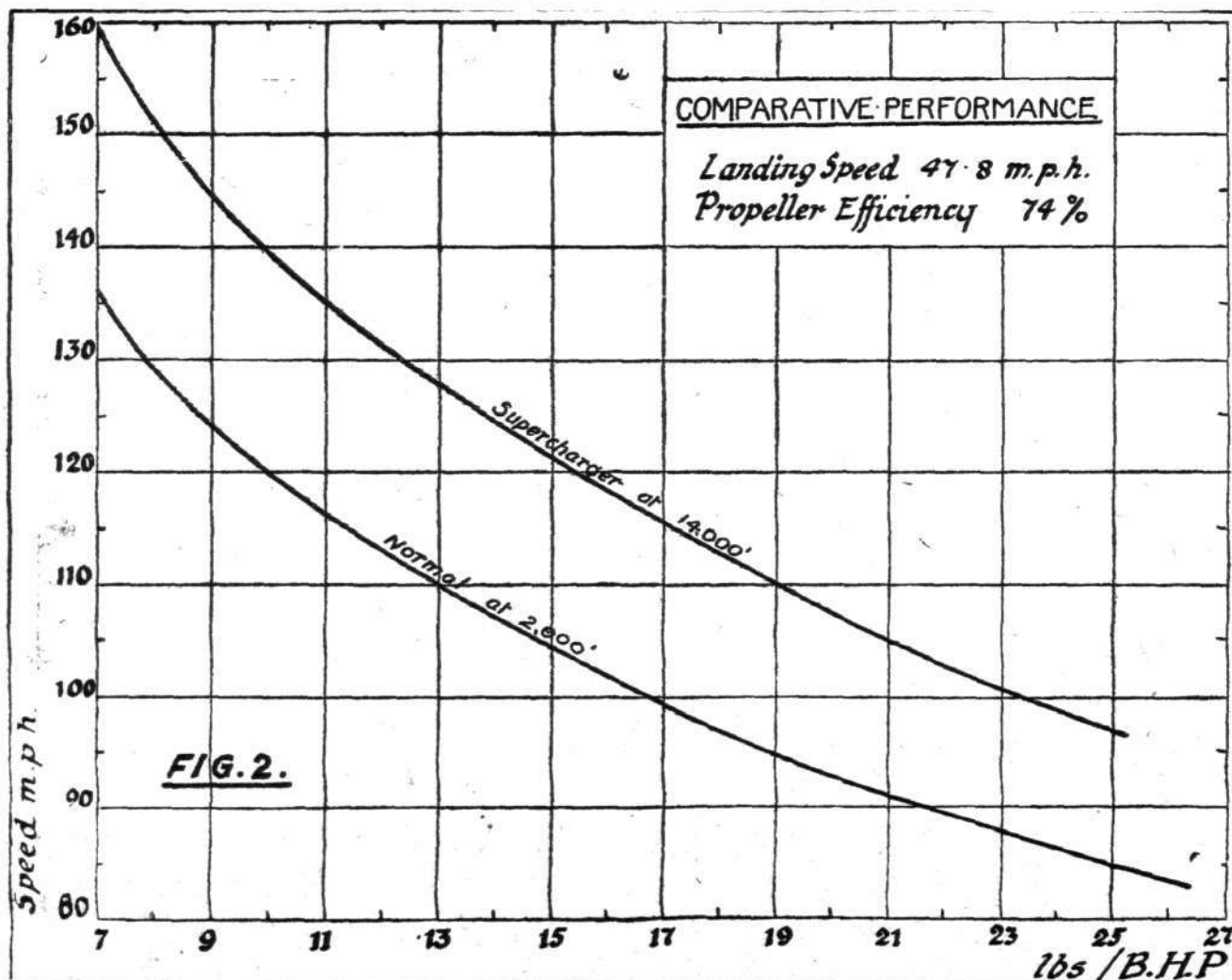
(a) Owing to the low landing speed imposed on aircraft by natural limits, high speed at low altitudes involves a poor L/D ratio; only some 60 to 65 per cent. of the possibilities of the machine being utilised.

(b) When flying at a given L/D, high altitudes give a most valuable increase in flight speed with no increase in resistance and an increase of power only proportional to the increase of speed.

(c) It explains the curious fact that the modern aeroplane, in spite of greatly reduced horse-power, is able to maintain a practically constant top speed up to a high altitude.

To enable a quantitative comparison of the gain from supercharging to be made, the curve of Fig. 2 has been drawn. It is based on Fig. 1 and calculated from it, and shows directly the connection between speed in m.p.h. and loading in pounds per b.h.p.

The lower curve is drawn for a normal-engined machine working at 2,000 ft., the upper for the same machine having a supercharged engine and working at 14,000 ft., in each case the basis of comparison is shaft horse-power and the same propeller efficiency, 74 per cent., has been assumed.





The gain in speed for a given loading and the gain in loading at a given speed show up very clearly. To further elucidate the matter Fig. 3 has been prepared. It shows these gains as direct percentage increments. It is interesting to note that the speed gain at given loading is approximately constant at 16 per cent., about half the per cent. increase in speed between sea-level and 14,000 ft. when flying at a constant L/D. The loading gain increases from 37 per cent. to nearly 60 per cent., being of far more importance the higher the speed concerned.

### THE PROPELLER.

A technical consideration intimately uniting the engine and aeronautical designer on the subject of supercharging is that of propeller design. If a machine having a supercharger engine be fitted with a propeller suitable for low altitudes, the engine will over rev. at her working height. Two proposals have been put forward for getting over this:—

(a) To provide the propeller with blades, the pitch of which can be increased at heights so as to utilise the greater horse-power available with the supercharger engine as compared with the ordinary motor.

(b) To provide a variable-speed gear-box so that the engine revs. can be kept approximately constant, those of the propeller being varied.

Both solutions are subject to disadvantages, the variable-pitch propeller offers the sweeter working mechanism, though the space into which the gear has to be fitted is small and the parts will be subject to centrifugal stresses.

The gear-box will always present the difficulty of changing gears and is likely to be cumbersome. So far as the writer is aware, it has not got further than the patent specification stage, but the variable propeller has been got into the air.

In discussions on the variable propeller, the pitch is usually regarded as being increased at high altitudes, and it is contended that this will cause a loss of efficiency large enough to counterbalance the gain due to the use of the supercharger engine.

This attitude in regard to the problem is misleading, and comes from the excessive value given to climb by war conditions. Any propeller designed for a supercharger engine will be designed to give its best at the working height selected, and the question is not that of any loss of speed and efficiency at heights, but of sacrifice of climb low down.

The variable propeller will have a normal pitch at high altitudes and a fine pitch at low. Its diameter will have to be greater than that of the ordinary type, but there will be no loss of top speed, only of climb.

So also the variable-speed screw will have a normal number of revolutions at heights and a lower rate of revolutions near the ground.

In both cases the loss of climb will be due to the propeller not having so good a form for working at climbing speeds as the normal air screw.

The real disadvantages to be faced, then, are the increase of propeller diameter and weight and the loss of climb involved. Practically the most serious consideration is the loss of climb.

To give some quantitative opinion on this point the writer has assumed the extreme case of a supercharger machine fitted with a fixed propeller designed to utilise the engine horse-power at 14,000 ft. On coming down to ground level the revolutions of, and horse-power supplied to, the propeller have been assumed to drop and the forward speed to be reduced all in such proportion as to keep the angle of attack of the blades constant.

Thus the condition of maximum efficiency at working altitude has been combined with a condition at sea level much worse than that which would be realised in practice by either variable pitch or variable-speed propeller.

The results of the calculations are as follow:—

Weight of machine	.. ..	600 lbs.
Characteristics those of curve Fig. 1.		
B.h.p., normal at sea-level	.. ..	400
Supercharger at 14,000 ft.	.. ..	380

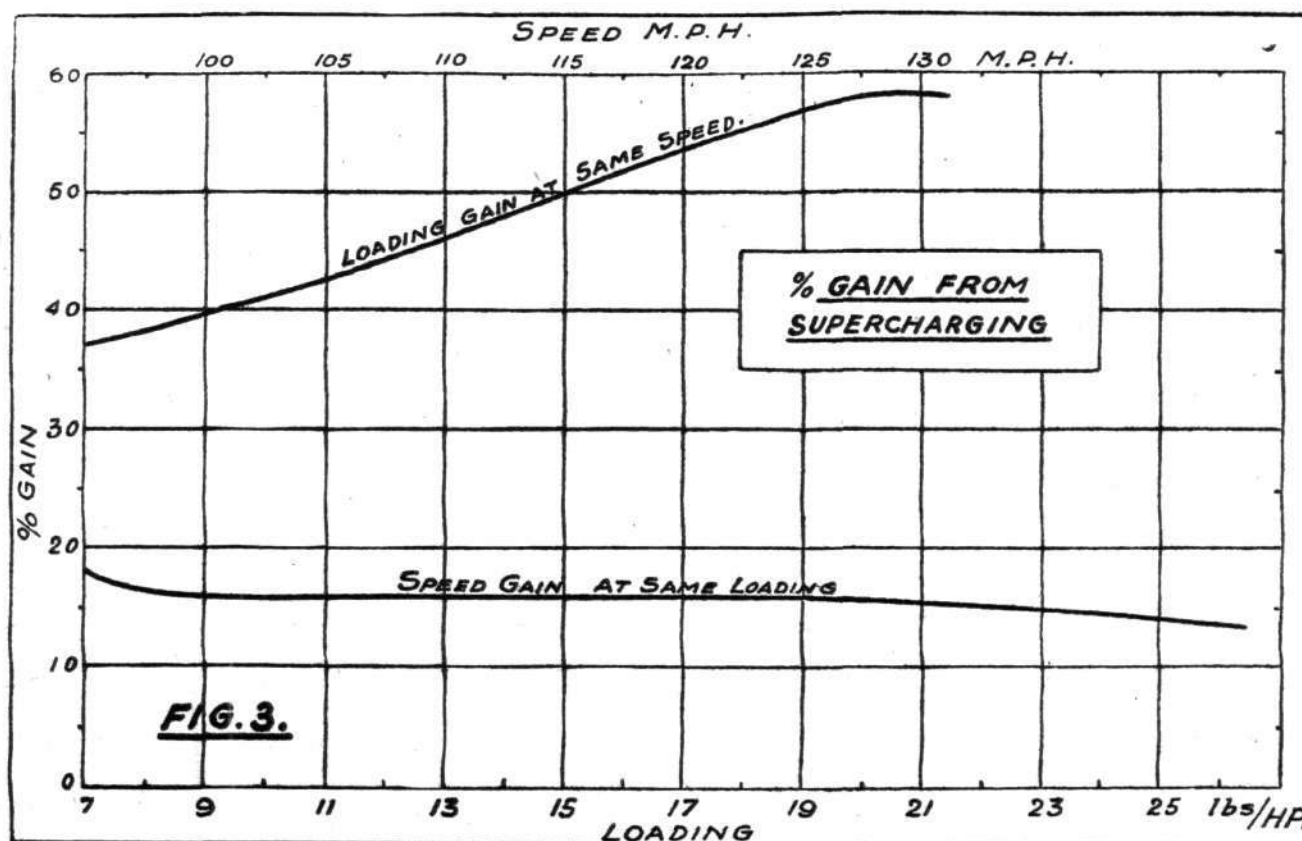
### Performance.

	Normal.	Supercharger.
Height, top speed.		
Sea-level	.. .. 105 m.p.h.	
14,000 ft.	.. ..	122 m.p.h.
Climb—		
Sea-level	.. .. 725 ft./min.	474 ft./min.
14,000 ft.	.. .. 580	605
Time to 14,000 ft.	.. 21.5 mins.	26 mins.

It will thus be seen that under very disadvantageous conditions the supercharger does not lose excessively. In practice better figures will be realised for the initial climb, with a corresponding reduction in the time to working height.

It is not improbable that for machines with light power loading the conditions assumed in the foregoing case may be accepted; for commercial work it is a question of balancing the length of flight and time of climb to the working height.

Propeller mathematics are lengthy, involved and liable to error, and for that reason no attempt has been made to give anything more than an indication based on extreme limits. For commercial work the important part of the gain is in the direction of speed, climb being of secondary importance so long as enough is available to enable the machine to handle well when getting off the ground and keep the time taken to get to working height within reasonable limits.



### WORKING CONDITIONS.

Certain practical working considerations have to be taken into account. The first is the man.

Fourteen thousand feet has been selected as a working height throughout these notes, because, so far as the writer's experience goes, a normal healthy man can work at this height pretty continuously, but if he is called upon to fly regularly at greater heights a really strong constitution is necessary.

The second is that of keeping a course above the clouds in bad weather. It would appear probable that the very remarkable work done in extremely bad weather (the writer speaks from personal observation) by the Paris-London service has largely been due to the pilots working the machines having learnt to know literally every inch of the ground covered, so that an occasional glimpse caught through clouds and mist is enough to give them their position. This will not be possible when working at 14,000 ft., and far more reliance must be put in navigation and directional wireless.

The third is the time taken on the climb.

In the working of commercial aircraft the machine is taken straight off the aerodrome, put on her course and kept at high speed, very little time being wasted in climbing, as 3,000 to 4,000 ft. seems to be the normal altitude. With a fast, high-powered machine this means that her speed is reduced for climbing for only a couple of minutes, but the supercharger machine will be on the climb for a much longer period, a serious matter on a short flight, but her higher speed at altitude makes it of less importance where long-range work is concerned. Further increased wind speeds will have to

be encountered at high altitudes, but on a year's service these will probably balance out.

The financial considerations influencing the use of supercharging will mainly be those of engine cost, the decision lying between the use of motors of large dimensions flimsily built and sturdier engines worked at a higher duty. There is regrettably little data upon which to form an opinion, but the determining factor must be reliability and a heavy engine working at low altitudes seems to be more reliable than a light one at high. A very faint indication upon which to base an engine policy, but the only one available. On the whole, the writer is inclined to believe that the engine costs of working per b.h.p. hour delivered will not be largely affected by the use or otherwise of supercharging.

In concluding these notes, the writer feels how little justice they do the next great problem facing aeronautical design, an art upon which peace has forced a totally new set of conditions. His object has been to give some simple indications of the outlines of the problem comprehensible to those whose mathematics have grown rusty—something that may hasten its solution by an increase of general interest.

Speed is the one thing aeronautics has to sell, and that is a valuable commodity, but to obtain it efficiency cannot be thrown away in any direction, and the modern high-speed aeroplane has a very low efficiency.

Flight at high altitudes increases the efficiency of the machine, but reduces that of the normal engine, and supercharging is the means whereby that deficiency may be made up. It offers high efficiency of both engine and aeroplane without excessive loss on the propeller: the three in one on which flying depends.

## “AEROPLANE STRUCTURES”

‘A MISTAKE in any design may, of course, cause loss of life, as, or example, in the collapse of a bridge, but more often it entails financial loss only. Mistakes in the design of aeroplane structures, however, nearly always mean accidents which are fatal or result in serious bodily injury to at least one or two men. There is, therefore, no room for error in this branch of engineering, and a sound knowledge of theoretical structures becomes imperative if successful designs are to be produced.’ This brief extract from the book entitled “Aeroplane Structures,” by A. J. S. Pippard & J. L. Pritchard, puts in a few sentences the *raison d'être* of the work, and the authors have presented the numerous problems which confront the “stress merchant” in as simple as possible a manner, consistent with accuracy. The authors have, as Mr. Bairstow points out in his introduction to the book, taken a leading part in applying the new methods of stress calculation which the special conditions relating to aeroplane structures have rendered necessary, and they are therefore singularly qualified to write a work on this immensely important subject.

In the first chapters the authors briefly, but clearly, deal with mechanics of flight, the detail structure of an aeroplane, the evolutions of an aeroplane in flight, which determine to a great extent the stresses in the various units, and which must be clearly understood by the designer in order to make allowance for the sudden loads which violent manoeuvres may throw on the wings or other units. The chapters on elastic properties of materials, and on bending moments, shear forces, stresses in beams, etc., which form this *résumé* will be found familiar by many from Morley's “Theory of Structures,” but only such general problems as have direct bearing on the aeroplane structure have been included.

From this point the book deals entirely with aeroplane structure problems, the chapters being devoted to such sub-

jects as forces on main plane structure, in all its aspects, internal forces in the *fuselage*, forces and loads on control surfaces, landing loads, the partially disabled aeroplane, and some general considerations in aeroplane design. The authors then proceed to detailed design, such as spars, struts, ribs and fittings, all of which are dealt with in a most lucid and interesting manner. A chapter is devoted to practical testing of all sorts of specimens as well as of complete wing structures.

Left until last is a fascinating chapter devoted to an excellent statement of the “Principle of Least Work,” a method which is shunned by the majority of engineers, but which, under the clear and logical guidance of the authors, becomes almost easy. Certainly its application is quite easy, even if the derivation of the method should appear somewhat difficult to follow. As the method is one which is likely to come into general use, especially when we come to metal construction, its clear statement in the present book is extremely opportune, and a study of this chapter should enable the student to find the stresses in structures which are statically indeterminate—i.e., which are redundant.

There are several appendices: one giving a number of tables for calculating spar stresses by the method of Mr. Arthur Berry, of King's College, Cambridge; another, abridgements of materials specifications issued by the Air Ministry, and another a series of tables of characteristics of aerofoils.

Messrs. Pippard and Pritchard are to be congratulated on the extremely efficient way in which they have presented the various problems, and we venture to think that the book will soon become a standard work on aeroplane structural design. “Aeroplane Structures” is published by Messrs. Longmans, Green and Co., of Paternoster Row, and the price is 21s. net.

### The England-Australia Flight

STEADY progress is being made by Capt. Ross-Smith and his companions on the Vickers-Vimy-Rolls which they are flying to Australia. They arrived at Delhi at 4.15 p.m. on November 25, and at 5 p.m. on November 27 they reached Allahabad, which place they left at 8.30 a.m. the next day for Calcutta.

Capt. Matthews and Sergt. Kay on the Sopwith “Wallaby,” were reported to have arrived at Vienna on Nov. 29. They were making their way to Belgrade, and had to land owing to bad weather and lack of petrol. Capt. Matthews said his journey had been hampered by ground mists, but he hoped to make faster time when he was out of Europe.

The Blackburn Kangaroo, which left Hounslow on November 24, left Romilly at 9.40 a.m. on November 25. It was delayed, but eventually arrived at St. Raphael at 4 p.m. on November 28. It left at 9.30 a.m. and, fighting against head-winds and rain, landed safely at Pisa. Resuming the flight next day, Rome was reached at 4.45 p.m., the 120 miles from Pisa taking four hours to cover owing to head-winds.

The Frenchman Poulet arrived at Calcutta on November 26, and left for Akyab (Burma) on November 28.

Arrangements have been made by the Australian Federal Government to furnish each pilot engaged on the Europe to Australia flight, on reaching Java, with the daily weather forecast of the Port Darwin area.



# REPORT ON VARIATION OF HORSE-POWER WITH ALTITUDE AND COMPRESSION RATIO\*

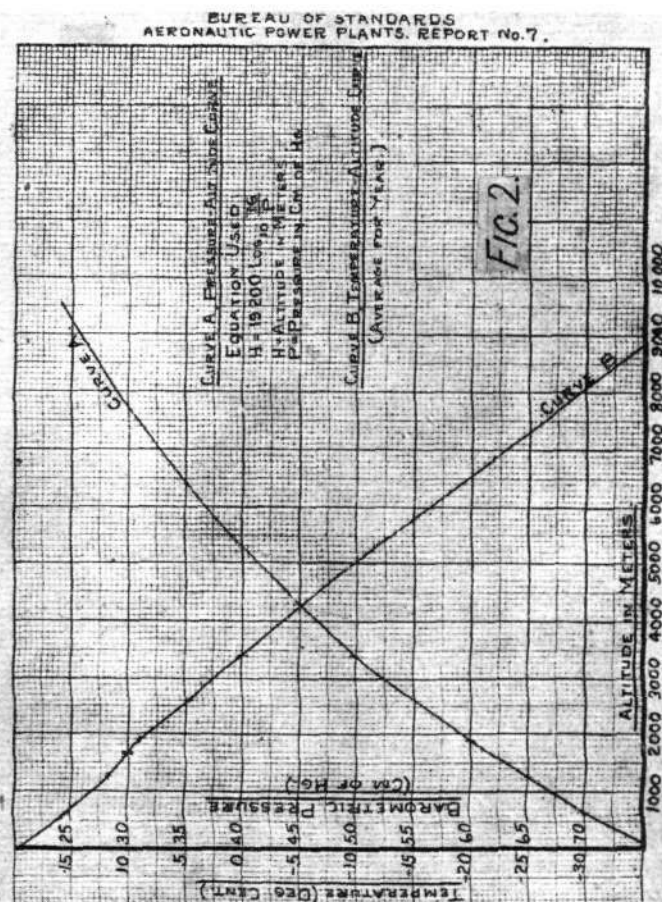
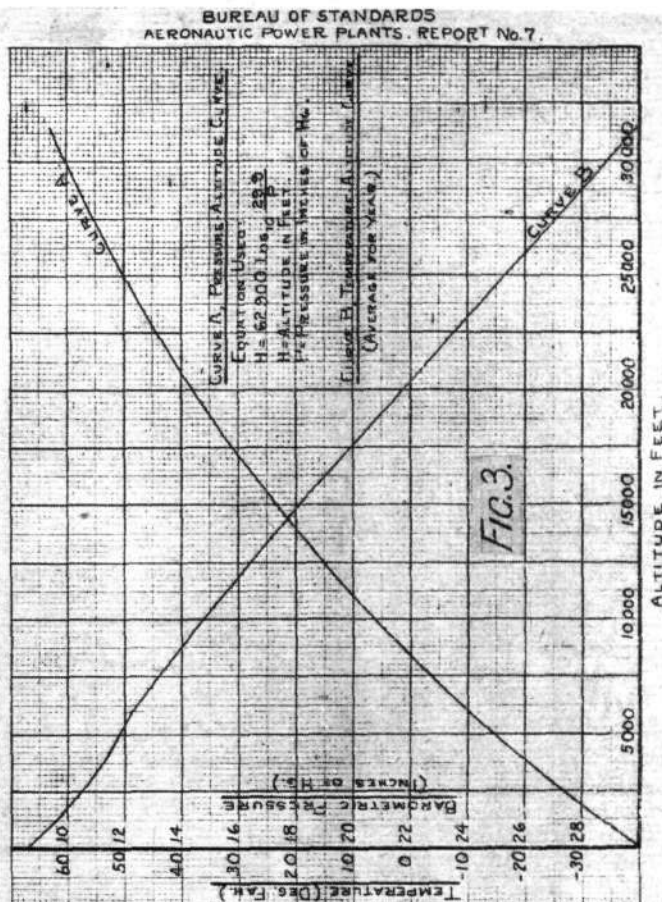
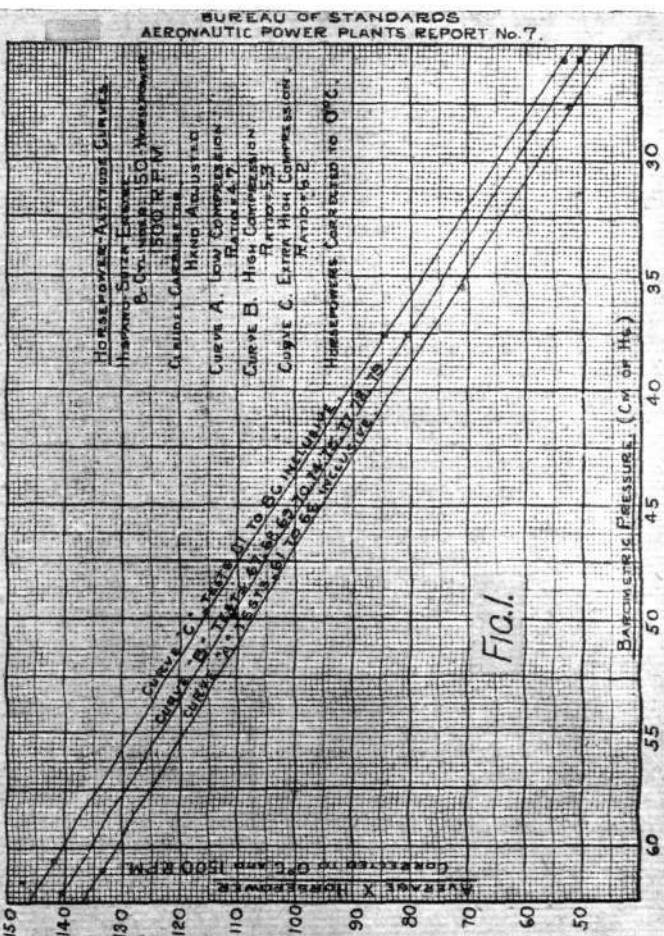
The following report is based upon the results of a series of tests conducted at the Altitude Laboratory of the Bureau of Standards. In this laboratory the engine under test is installed in a concrete chamber having insulated walls and from which the air may be partially exhausted by means of a blower, thus reducing the barometric pressure within the chamber to a point corresponding to the pressure at any desired altitude. At the same time, by passing the air, as it enters the chamber, over a series of refrigerating coils, the temperature may be regulated during the tests. The power of the engine is absorbed by an electric dynamometer placed outside the chamber and connected to the engine by a shaft and coupling. Measurements of power are made by weighing the torque on the dynamometer field. A complete description of this apparatus and methods of observation was published in the issues of *FLIGHT* for October 16 and 23, 1919.

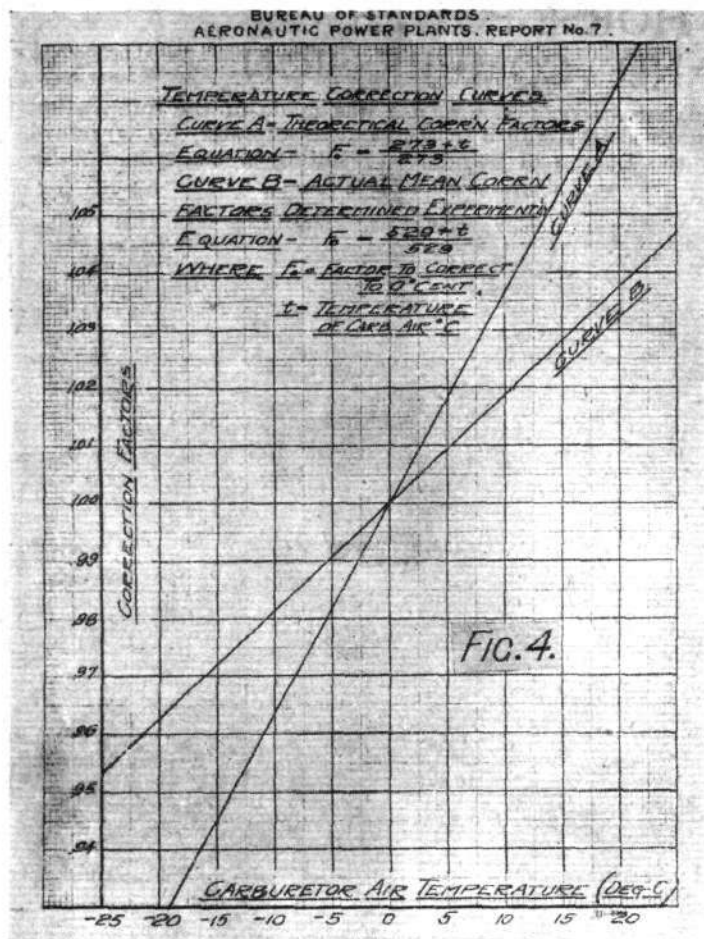
A stock Hispano-Suiza, 8-cylindrical engine, rated at 150 horse-power, and built by the Wright-Martin Aircraft Corporation, New Brunswick, New Jersey, was used in making these experiments. This engine is furnished with three sets of pistons, designated as "low," "high," and "extra high" compression, the ratios of compression, that is cylinder volume being approximately 4.7, 5.3, and 6.2 respectively. All of the tests were run on a single grade of gasoline designated as "X," with a Claudel carburettor, which was adjusted by hand in each case to give the maximum power. All the results are based upon an engine speed of 1,500 r.p.m. In the earlier tests the horse-powers were corrected to 0° C., while in the later ones they were corrected to standard temperatures for given barometric pressures as will be described in a subsequent paragraph.

Tables I, II and III give the results of a number of tests using the three different sets of pistons, the horse-powers deduced from these tests having been corrected to 0° C. The data contained in these tables are plotted in Fig. 1.

As it is desirable to obtain the relations existing between barometric pressure and horse-power developed under the actual conditions of flight, the observed horse-power must be corrected from the temperature during the test to the mean temperature encountered in actual flight at the given barometric pressure. To obtain this relation between temperature

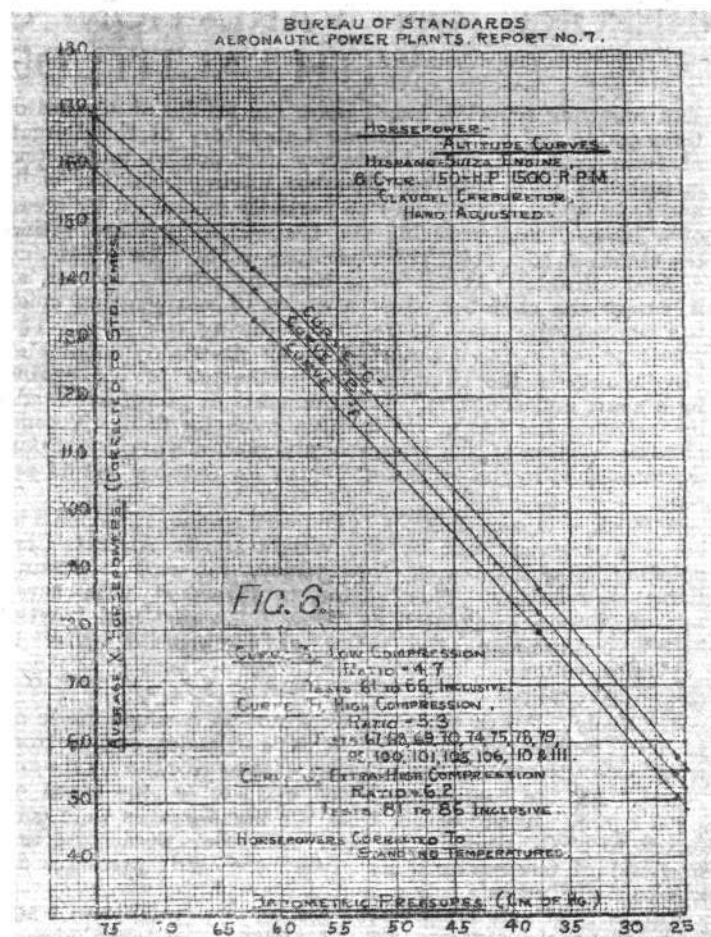
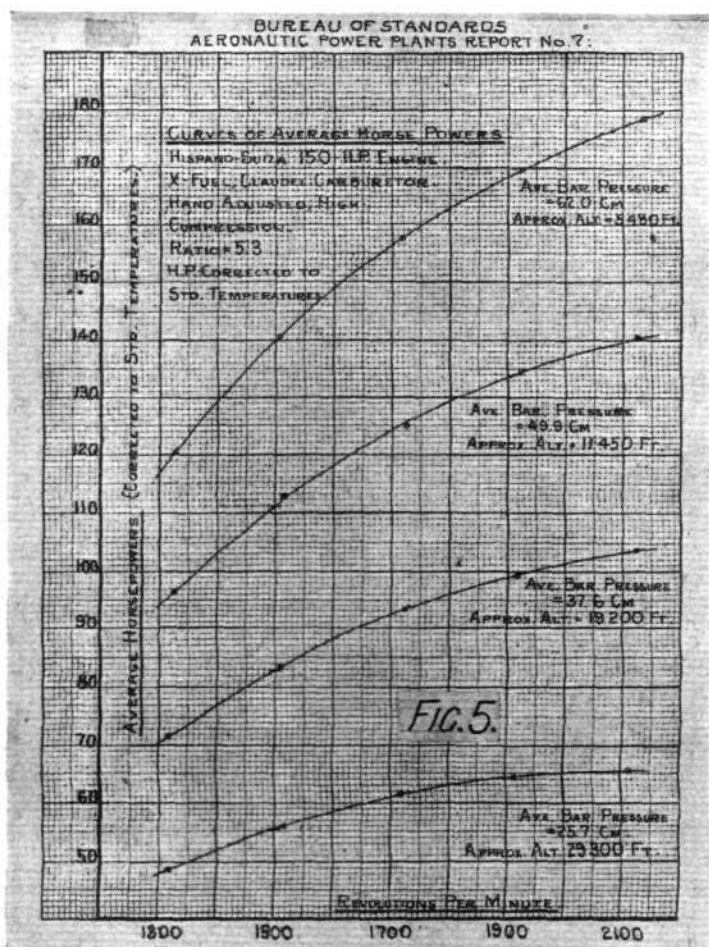
and barometric pressure, use was made of the information contained in Aeronautic Instruments Circular, No. 3, issued by the Bureau of Standards, resulting in the temperature-





altitude curves marked "B" in Figs. 2 and 3. The curve in Fig. 2 is in metric, and that in Fig. 3 in English units.

To correct a given horse-power,  $HP_o$ , at a given barometric pressure from 0° to some temperature,  $t$ , at the same barometric pressure, we may make use of the following relation:

$$HP_o = HP_t \times F_o \quad (1)$$


In which—

$HP_o$  = horse-power at 0° C., at the given barometric pressure.

$HP_t$  = horse-power at temperature  $t$  degrees Centigrade at the given barometric pressure.

$F_o$  = correction factor to reduce horse-power from  $t$  degrees to 0° C.

Values of  $F_o$  for any given temperature,  $t$ , may be obtained from curve B, or its equation, both of which are given in Fig. 4, which is a mean curve of correction factors obtained from the results of a number of tests performed at the altitude laboratory with two different carburetors and at various altitudes.

We may obtain an expression for  $HP_t$  in terms of  $HP_o$ , by transposing equation (1), as follows:

$$HP_t = \frac{HP_o}{F_o} \text{ or } HP_t = HP_o \times \frac{1}{F_o} \quad (2)$$

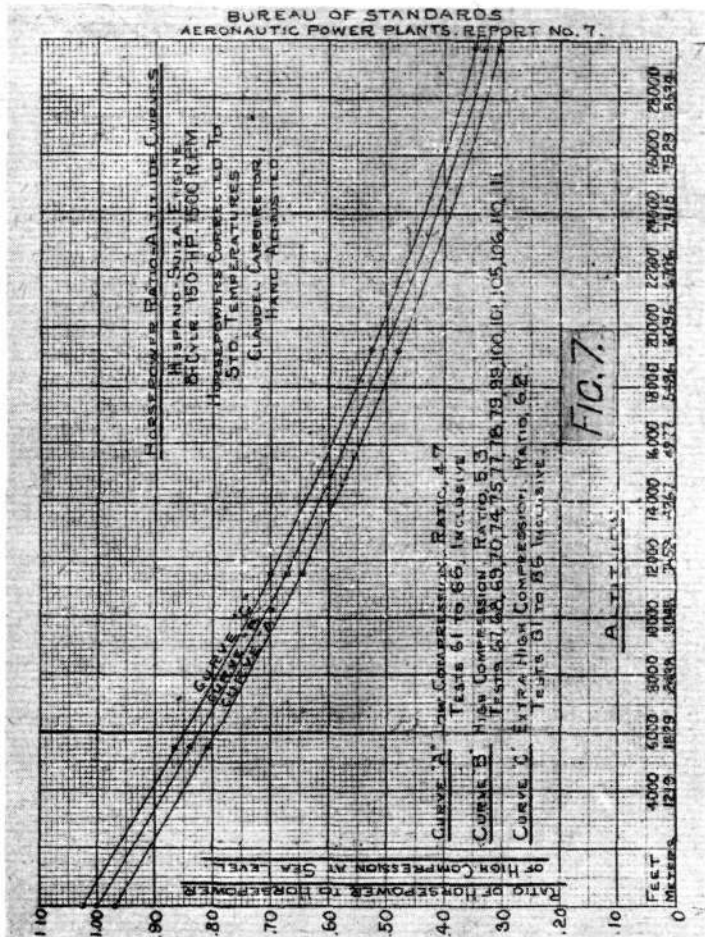
in which  $\frac{1}{F_o}$  is a factor to correct from 0° Centigrade, to the given temperature,  $t$ .

In the tests performed in the altitude laboratory the runs were conducted at four barometric pressures which were adopted as standards for comparing the results of different tests, and also to facilitate computations. In the later tests, series 99 to 111, carried out with the high-compression pistons, the horse-powers were corrected to the mean temperatures corresponding to the observed barometric pressures, consequently it was necessary to establish a set of standard temperatures corresponding to the different standard barometric pressures. The mean values of these four "standard" temperatures obtained from curve in Fig. 2, together with the corresponding approximate altitudes, are as follows:

Barometric pressure in centimetres of Mercury.	Temperatures in Degrees Cent.	Approximate Altitude in feet.
62.1	10.1	5,500
49.8	0.1	11,500
37.6	-15.1	19,200
25.6	-36.6	29,600

Values of horse-power for the three compression ratios were obtained from curve in Fig. 1 at the standard barometric pressures, and tabulated in Table IV. These were corrected from 0° C. to the standard temperatures by use of equation (2), giving the values of horse-power corrected to standard temperatures for the three earlier series as tabulated in the last column of Table IV.





The runs in series 99 to 111 were made at various speeds. Table V gives the observed values of speed and horse-power at the different altitudes for this series. These data are averaged and plotted in Fig. 5, and the values of horse-power at 1,500 r.p.m. taken from the resulting curves are tabulated and averaged in Table VI with series 67 to 79, both series

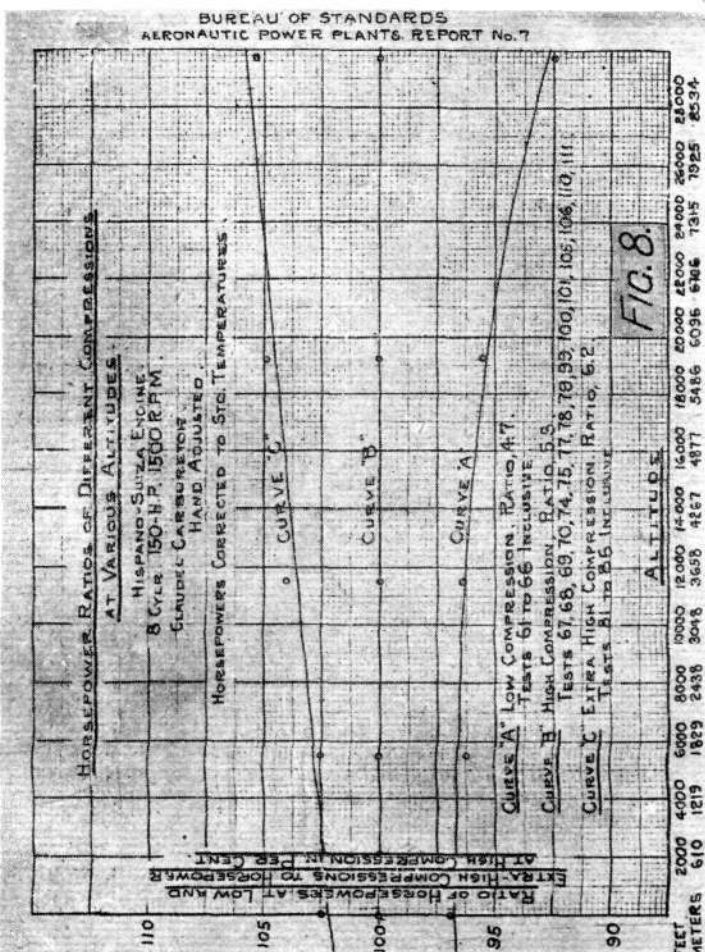


TABLE I.—Average Horse-Powers and Barometric Pressures for Tests on X Fuel—Low Compression Ratio = 4.7

Horse-powers corrected to 0° C.

Test No.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.
61 ..	61.1	135.6	48.0	106.0	—	—	—	—
62 ..	61.5	134.8	48.5	104.6	35.4	71.8	27.7	51.4
63 ..	61.5	133.1	48.5	102.4	35.7	70.0	27.7	52.7
64 ..	60.8	131.8	48.0	102.7	35.4	70.9	27.7	52.7
65 ..	—	—	48.3	103.0	35.4	72.1	27.8	54.0
66 ..	60.7	131.0	48.0	101.0	35.4	70.1	27.7	51.0
Average	61.1	133.3	48.2	103.3	35.5	71.0	27.7	52.4

TABLE II.—Average Horse-Powers and Barometric Pressures for Tests on X Fuel—High Compression Ratio = 5.3

Horse-powers corrected to 0° C.

Test No.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.
67 ..	62.2	144.0	49.9	111.4	37.7	80.5	25.7	50.3
68 ..	62.1	140.4	49.9	111.2	37.7	79.5	25.7	51.0
69 ..	61.9	141.5	49.6	112.8	37.2	80.5	24.9	51.3
70 ..	62.0	142.1	49.8	112.1	37.6	80.5	25.7	51.2
74 ..	62.2	141.1	50.1	110.2	37.8	80.6	25.7	48.8
75 ..	62.3	138.0	48.8	109.1	37.6	80.4	25.7	50.6
77 ..	62.0	135.8	50.1	115.0	37.7	80.7	25.7	52.2
78 ..	61.9	142.0	49.8	106.5	37.6	79.8	25.6	50.3
79 ..	62.0	138.7	49.9	108.5	37.7	81.5	25.8	49.4
Average	62.1	140.4	49.8	110.8	37.6	80.4	25.6	50.6

TABLE III.—Average Horse-Powers and Barometric Pressures for Tests on X Fuel—Extra High Compression Ratio = 6.2

Horse-powers corrected to 0° C.

Test No.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.	Bar. Press.	h.p.
81 ..	60.6	145.9	49.7	117.6	37.6	85.7	25.7	53.7
82 ..	60.6	142.5	49.7	114.4	37.6	85.4	25.7	53.7
83 ..	60.6	139.4	49.7	115.9	37.6	85.5	25.7	53.0
84 ..	60.6	143.1	50.0	116.7	37.6	85.4	25.7	53.1
85 ..	—	—	49.7	112.9	37.6	82.8	25.7	52.5
86 ..	60.5	138.9	49.6	113.9	37.5	84.1	25.7	53.9
Average	60.6	142.0	49.7	115.2	37.6	84.8	25.7	53.3

TABLE IV.—Table of Data for Reducing Horse-Powers from 0° C. to Standard Temperatures

Bar. Press. in Cms. of Hg.	Average Temperature from Curve in Fig. 2, Deg. Cent.	Correction Factor from Curve B in Fig. 3 = (F <sub>0</sub> )/F	Factor to correct from 0° C. to Std. T. = 1/(F <sub>0</sub> )/F	Horse-power from Curves in Fig. 1 = HP <sub>0</sub> .	Horse-powers corrected to Std. Temperatures.
				Compression.	h.p.
62.1	10.1	1.019	.981	Ratio— Low = 4.7 High = 5.3 Ex High = 6.2	136.0 140.4 145.3
49.8	— 0.1	1.000	1.000	Low = 4.7 High = 5.3 Ex High = 6.2	106.9 110.8 115.2
37.6	—15.1	.972	1.029	Low = 4.7 High = 5.3 Ex High = 6.2	76.9 80.3 84.4
25.6	—36.6	.931	1.074	Low = 4.7 High = 5.3 Ex High = 6.2	46.9 50.3 53.5

**TABLE VA.—Observed Horse-Powers, R.P.M.s. and Barometric Pressures for X Fuel, Series 99 to 111**

Horse-Powers corrected to Standard Temperatures  
Approximate Altitude = 5,500 ft.

Test No.	Bar. Press.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.
99	62.0	1310	119.7	1504	141.9	1710	158.3	1923	168.7	2110	174.2
100	61.9	1325	126.1	1515	147.1	1715	162.7	1935	173.4	2140	181.0
101	62.1	1300	114.2	1518	135.0	1715	154.0	1920	165.1	2155	177.1
105	62.3	1375	124.0	1525	141.7	1725	158.0	1965	173.2	2140	179.3
106	62.1	1365	122.8	1536	140.4	1763	153.4	1925	165.8	2140	174.2
110	61.9	1305	118.9	1480	139.9	1695	159.2	1890	171.4	2120	182.0
111	61.9	1315	116.3	1485	137.2	1700	157.0	1910	171.0	2156	181.1
Av.	62.0	1328	120.3	1509	140.5	1718	157.5	1924	169.8	2137	178.4

Approximate Altitude = 11,500 ft.

99	49.90	1310	96.2	1517	114.0	1715	127.0	1907	134.9	2105	139.5
100	49.80	1315	96.5	1500	113.0	1725	126.7	1930	138.6	2115	143.0
101	49.90	1315	93.9	1505	109.9	1730	118.7	1925	127.9	2107	133.2
105	50.20	1340	95.8	1515	110.8	1715	124.0	1910	134.0	2135	140.5
106	49.80	1370	96.8	1540	111.2	1750	120.7	1945	130.5	2150	135.0
110	49.80	1327	101.2	1540	119.8	1710	130.2	1915	138.7	2120	144.8
111	49.95	1305	92.9	1500	111.0	1737	126.9	1927	137.2	2130	144.5
Av.	49.9	1326	96.2	1517	112.8	1726	124.9	1923	134.5	2123	140.1

**TABLE VB.—Observed Horse-Powers, R.P.M.s. and Barometric Pressures for X Fuel, Series 99 to 111**

Horse-Powers corrected to Standard Temperatures  
Approximate Altitude = 19,200 ft.

Test No.	Bar. Press.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.	Speed.	h.p.
99	37.6	1300	71.2	1500	84.6	1715	95.2	1920	100.6	2100	103.3
100	37.5	1310	71.7	1500	83.3	1720	95.0	1920	99.5	2135	107.0
101	37.8	1310	69.4	1520	81.0	1725	88.9	1940	95.6	2120	98.5
105	37.7	1355	71.4	1528	82.3	1725	90.6	1923	98.4	2140	105.4
106	37.5	1360	72.8	1515	82.6	1745	91.7	1925	98.6	2140	102.5
110	37.5	1289	74.0	1513	88.3	1718	96.7	1896	99.4	2100	105.7
111	37.6	1310	71.1	1487	82.8	1717	94.2	1910	101.9	2125	105.2
Av.	37.6	1319	71.7	1509	83.6	1724	93.2	1919	99.1	2123	103.9

Approximate Altitude = 29,600 ft.

99	25.7	1303	47.7	1535	56.6	1730	61.4	1930	62.6	2105	65.1
100	25.5	1330	48.4	1505	55.8	1725	61.8	1930	64.4	2105	64.1
101	26.0	1314	45.1	1512	52.9	1707	58.3	1924	62.4	2120	63.1
105	25.9	1310	47.3	1505	55.8	1705	61.4	1914	65.9	2115	68.8
106	25.7	1370	47.6	1560	54.4	1735	59.6	1885	60.8	2085	60.8
110	25.7	1290	48.2	1510	57.2	1723	63.6	1900	64.8	2120	63.2
111	25.7	1310	51.2	1505	59.1	1710	65.7	1937	69.9	2130	72.0
Av.	25.7	1318	47.9	1519	56.0	1719	61.7	1917	64.4	2112	65.3

**TABLE VI.—Table of Data for Averaging Horse-Powers for High-Compression from Series 67 to 79 and 99 to 111**  
Horse-Powers corrected to Standard Temperatures

A—Averages from Table IV.			B—Averages from Tables VA and VB.			C—Averages from A and B.		
	Bar. Press.	h.p.		Bar. Press.	h.p.		Bar. Press.	h.p.
Average of Nine Tests, Series from 67 to 79	62.1 49.8 37.6 25.6	137.7 110.8 82.6 54.0	Average of Seven Tests, Series from 99 to 111	62.0 49.9 37.6 25.7	140.0 111.0 82.8 55.3	Average of 16 Tests, Series from 67 to 79 and 99 to 111	62.05 49.85 37.60 25.65	138.9 110.9 82.7 54.65

being on the high-compression ratio 5.3. The averaged data are plotted in Fig. 6, together with the corresponding data for the other two compressions (4.7 and 6.2) obtained from the last column of Table IV, giving curves of horse-power at 1,500 r.p.m. corrected to standard temperatures versus barometric pressure for the three compressions.

From these curves the ratios of the different horse-powers for each compression to the horse-power at sea level for the high (5.3) compression were computed. These ratios were plotted in curve, Fig. 7, against altitudes in feet corresponding to the different barometric pressures. The altitudes were computed from the formula:

$$h = 62900 \log_{10} \frac{76}{p}$$

obtained from the Smithsonian Meteorological Tables for 1907, page 100, in which  $h$  is the altitude in feet, and  $p$  is the atmospheric pressure in centimetres of mercury.

The curves in Fig. 8 illustrate the variation in horse-power with compression ratio at different altitudes.

The horse-power developed with the 5.3 or "high" compression ratio, at the different altitudes, was taken as 100 per cent., and the other two compression ratios were plotted as percentages of this curve. As will be seen upon examination, the gain in horse-power due to "extra-high" over "high" compression amounts to but 2.8 per cent. at 5,000 ft., while it increases to nearly 5.8 per cent. at 30,000 ft. Like-

wise the decrease in horse-power due to "low" compression, while only 3.3 per cent. at 5,000 ft., amounts to about 7.3 per cent. at 30,000 ft.

It is evident, therefore, that the value of high compression is more apparent at high than at low altitudes.

It should be pointed out that any comparison of absolute horse-powers for the different compression ratios may be misleading, as the engine conditions, such as fit of piston and rings, condition of valves, etc., were not the same in each case. However, the manner in which the horse-power varies with barometric pressure in each case may be taken as characteristic for the given combination of engine, carburettor, and fuel with a given compression ratio.

In conclusion, it may be stated that practically all the tests conducted in the Altitude Laboratory have a nearly equal bearing on the relation of horse-power to altitude. Any given set of conditions, which affect the operation of the engine, may be held approximately constant during one test, and the variation of horse-power with altitude determined for these conditions. Only a small amount of this information has been collected in this report, as the tests upon which it is based were chosen particularly to show the power-altitude relation at different compression ratios.

Supplementary reports will be issued as additional information becomes available either as the result of experiments already completed or ones to be carried out in the future.

## Re-Opening of Recruiting for the R.A.F.

OWING to the large number of men who are due for discharge on the completion of their engagements, recruiting for the R.A.F. has now been re-opened and there are vacancies for skilled mechanics of various trades.

Engagements are for 4, 6 or 8 years with the Colours, with 8, 6 or 4 years respectively with the reserve.

In view of the newly-revised rates of pay of the Force, the openings are distinctly attractive, particularly as men will be working at their own trades and constantly gaining fresh

experience which will be of great value to them on their return to civil life, by which time in all probability there will be a greatly increased demand for aircraft workers of all categories.

Skilled aircraft workers who are at present unemployed, of those who are not employed in their own trades, would, therefore, be well advised to consider the possibilities of the careers offered by the Service.

Full details as to pay, etc., may be obtained from 4, Henrietta Street, London, W.C., or from any R.A.F. station.



# AIRISMS

## FROM THE FOUR WINDS

THE strength of a nation's fighting force is its insurance premium against wars. When false economists scream against a strong aircraft fleet and preparedness generally, let them bear in mind one of Lord Jellicoe's most recent utterances in Canada: "Despite the remoteness of future wars, Britain should be prepared, just as any man prepared against fire. They appreciated the necessity for economy but, appreciating that, they should not forget the cost of one day of the Great War."

FROM the story and statistics compiled by the Navy League and published in their official journal, regarding the sinking of submarines in the War, the figures, as given, for the work of seaplanes are somewhat striking. It has hitherto been popularly accepted that quite a big batch of these pests was actually sent to "kingdom come" by aircraft. The actual number credited as destroyed by bombs from seaplanes is five, and by airships one. The five accounted for by seaplanes were despatched between May 20 and September 28,

1917. This is getting down to earth, so far as actual destruction is concerned, although there are instances which appear to have been overlooked in the League's summary, by way of example, the sinking of a submarine off Ostend on August 26, 1915, by bombs from an aeroplane piloted by Comdr. Bigsworth. But where the real strength and value of aircraft came in in our forces countering the Hun submarine menace, was in the "spotting" carried out, enabling many a one to receive the *coup de grâce* by co-operating methods.

THAT it is necessary and expedient for the Government to close down the National Aircraft Factory at Waddon may well be. But it would appear to be inviting trouble in the long-run for the Croydon Council to suggest that the Government should start manufacturing useful wood and metal goods there. Surely it is due to private enterprise to take on the task in that or some other industrial form. With scarcity of factory buildings, there should be no necessity



**MOST ANNOYING!—II.** When you've left your cigarette case in your hip pocket and you've got your sidcot on.

to further link up bureaucracy with the future. Or, happy thought, as that criminal, the capitalist, is to be wiped out and done without, could there be a more opportune moment for the advocates of his annihilation proving his uselessness, by starting the factory upon their own. Think it over.

It was certainly a somewhat drastic method of spoiling an extremist's meeting recently in Cairo, when an aeroplane crashed into a private house, where a demonstration was in course of gathering. It is not surprising to hear that the "demonstrators" scurried in all directions, and that, for the time, at least, all effective demonstration was done in.

LORD SYDENHAM is always worthy of respect and attention in the views he expresses. Particularly is this so in the case of matters pertaining to Air policy. In his remarks upon the present burning question of a *real* independent Air Service, he has endeavoured to define the fundamental issue at stake. "Fleets and armies," he writes, "need attached aircraft, which are now essential to their operations. If the Admiralty and War Office proceed to build up separate air services, the essential homogeneity of an Air Force will be destroyed. Its problems will not be dealt with as a whole, and its scientific progress will certainly be arrested. But this is not all. Air force now means something infinitely greater than an arm auxiliary to the other combatant organisations. It is a most powerful independent fighting service, capable in some conditions of deciding a war by its own unaided action, of carrying out vastly important offensive operations without assistance, and, on the other hand, of providing the most effective defence against an enemy's air attacks. The Air Force which we possessed in the later stages of the War could have done more than was accomplished if its offensive power had been turned to the fullest account. It has a psychology of its own, and it will never reach the full measure of achievement unless it develops a distinct air policy and is trained in peace and directed in war by flying men. . . . Opinions will doubtless settle down on sane lines; but any mistake in handling air policy will endanger the future security of the Empire."

This week there should be *some* enlightenment with Lord Montagu in the Lords and Gen. Seely and Lord Hugh Cecil in the Commons on the war-path upon the subject.

AN Order of the Army Council and the Air Council just issued provides that officers and airmen of the Royal Air Force acting with the military forces under or within the Command of the General Officer Commanding-in-Chief the British Army of the Rhine shall in all respects be subject to the Army Act while on active service as if they were officers and airmen attached to the Army.

But surely this has been the position all through? It is the crux of the proper working of the Air Service as a separate unit.

Is it a case of Cause and Effect that the Ironmongers' Hall in Fenchurch Street, which was partially destroyed in an air raid in July, 1917, has been sold to a firm of coal merchants? At least the raiding may well have served as a plausible excuse for thus passing on the site at the present hugely enhanced value—in paper money—obtainable for any old thing.

HERE in any case we have a definite "cause and effect" example:

DATTA KHEL, November 19.—The recalcitrant Kazha section of the Madda Khel Waziris had occasion today to realise the inflexibility of the British terms. At eight o'clock no reply had been received to the 24 hours' ultimatum, and within half an hour 17 aeroplanes were flying over Ismail Khel with a full complement of bombs. They unloaded four tons on the recalcitrant tribesmen. The airmen descended to 300 ft., and, according to evidence received, the villages were left mere heaps of dust.

A few chiefs who were detained at Datta Khel were visibly impressed by the sight of the aeroplanes passing over to Ismail Khel. One truculent chief, who spoke boldly and almost insolently to Major-General Skeen yesterday, deeming the threat of aeroplanes idle, was seen wringing his hands as the sound of bombs came over the hills.

The bombing operations against the Waziris have been so successful that further operations will probably be unnecessary, though the column may march through the Wazir country in order to impress the tribesmen.

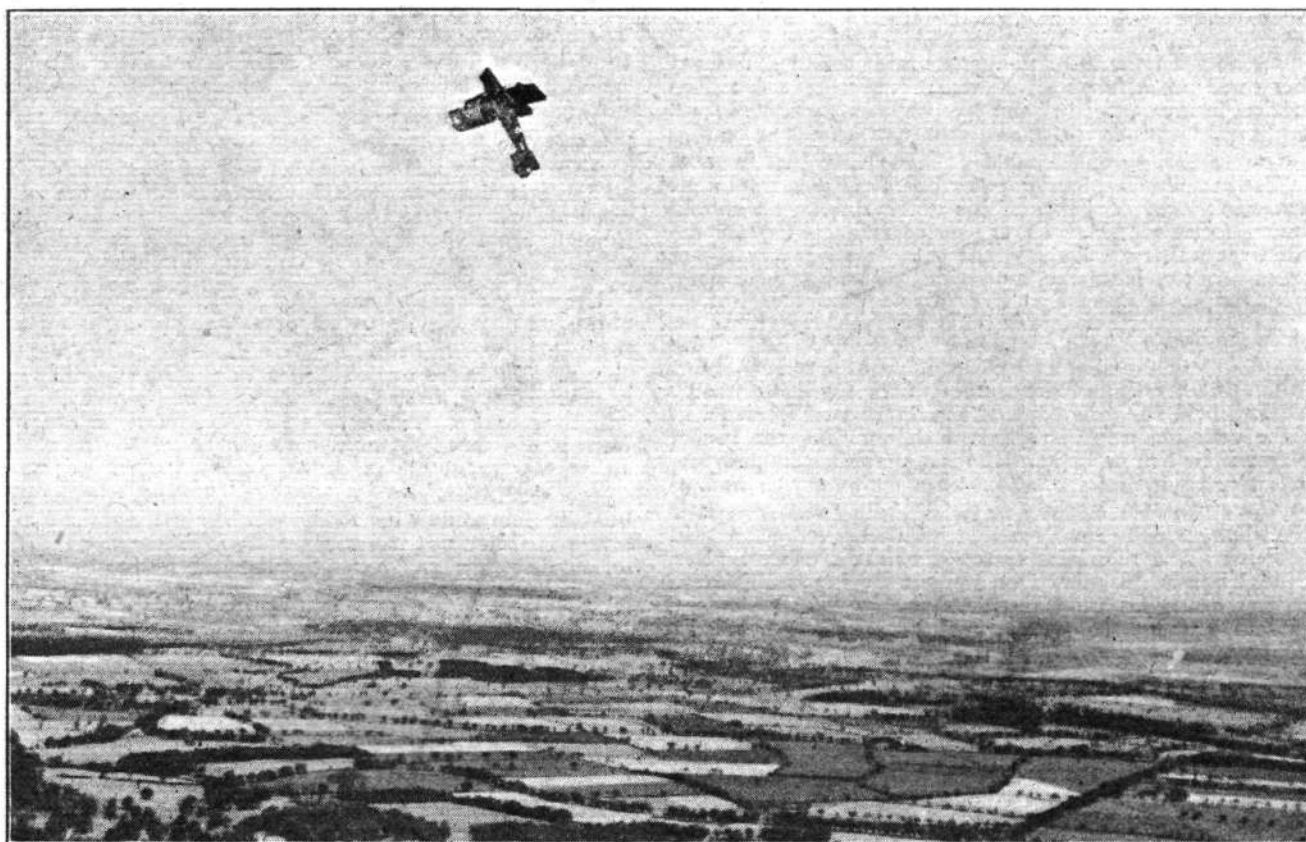
It should be noted that, since the despatch of the above message, which was delayed ten days in transmission, the submission of the Waziris has been announced.



"Flight" Copyright

Homing at Dusk—the last flight of the day, on an Avro waterplane off Brighton





"Flight" Copyright.

Looping the loop, Norwich way, on the big Boulton and Paul machine

In the announcement by the M.O.M., without any reference to the owner, of the sale of Turnhouse, the big aerodrome about two miles from the Forth Bridge, is to be found what looks like an uncommonly ugly example of bureaucracy run mad. No wonder Lord Rosebery, the freeholder, waxes sarcastic in a letter to the *Scotsman*, thus: "I have been furnished with an advertisement, probably from your columns, of the sale of Turnhouse Farm, under the direction of the

Ministry of Munitions. I cannot help being surprised at this, because I am under the impression that the farm belongs to me and not to that Ministry. At first sight this might seem to be due to the adoption of Irish methods by our Ministers, but I do not wish to exaggerate, and I do not think this is due to lawlessness, but simply to gross carelessness, arising, I believe, from the fact that the Government during the War have so abridged the rights of individuals



A 1,000-lb. bomb in front of a Sikorsky biplane

that its numberless Departments have come to the conclusion that these no longer exist."

It may be carelessness or deliberate annexation, but Lord Rosebery will be fortunate if he reaps any benefit from the transaction in any case, judging by other cases of "grace" which have been so dis"grace"fully prevalent under bureaucracy. This object-lesson and the case put forward by Mr. Tankerville Chamberlayne of the outrageous treatment in connection with property of his at Southampton should once more focus attention on the absolute necessity for the immediate abolition of the temporary power placed—or misplaced—in the hands of a gang of inefficient swankers.

WHERE the astute man of business comes in at the expense of the public war-purse is well exemplified in a suggestion of Mr. Calder at a meeting of the Council of the English Forestry Association, held the other day at the Surveyors' Institution, when the question was discussed of encouraging the use of home-grown timber in view of the large increase in the price of foreign product and its probable effect upon the finance of the Government's housing scheme. The point was how to fill orders, which the President of the Association said were coming along requiring seasoned oak and other timber. Had the Timber Supplies Department drying facilities of which those outside could avail themselves of? he asked. Mr. Calder, in saying the drying could be arranged for, offered the further information that "the drying kilns of the Air Board and the M.O.M. were to be obtained at practically scrap prices." So far good, but now, from the taxpayers' point of view, what we do not quite understand is who was looking after the said taxpayers' interests, having regard to the fact that Mr. Calder is described in the report of the meeting as "Chief of the Disposal Board of the Timber Supplies Department."

FROM Sandwich comes a story of a forgotten anti-aircraft station. Golfers in this seaside town, writes a *Times* correspondent, "have been astonished to find an anti-aircraft station still in being in spite of the fact that a fortnight has elapsed since the celebration of the first anniversary of the Armistice. The station, which is known as the 45th Anti-aircraft Station, is situated in the Haven, and is connected with another station in Sandwich Bay. The station is in charge of a sergeant and one other rank, and every other day a R.A.S.C. lorry visits the spot with rations of fresh meat and vegetables.

"It is true that parts of the guns at the two batteries have been removed, but one gets the impression that with the

exception of the fact that rations are regularly delivered, the stations and men have been forgotten by the authorities. The men seem to have no work of importance to do except to look after a few stores."

WONDER if there are many more forgotten depôts about like this one. At the same time, it must be remembered that certain anti-aircraft stations should be kept in activity for all time, if merely as training centres. When the great air-war does arrive, "Anti's" should be as common as milestones, if we haven't all become cave dwellers by that time.

UPON aerial post issues Mr. F. J. Melville writes in the *Telegraph*: "A number of new aerial post stamps are to hand this week, including the first air-mail stamps from Japan. These are two of the current ordinary postage stamps of that country, the 1½-sen blue and the 3-sen red, on each of which is overprinted a small outline of a biplane. These were issued on October 3 in readiness for the first flights of an experimental air service between Tokyo and Osaka, a distance of about 290 miles by air. The stamps were only to be valid for one month, and the total quantity of the two stamps issued is stated not to exceed 40,000. They were only placed on sale at first and second class post offices in Tokyo and Osaka, but the entire issue was sold out within an hour or two.

"With reference to the mail service, this was to have started on October 4, and prizes were offered in connection with the flights for the quickest successful round trip. But unfortunately the weather on the 4th was not favourable, and on the following day it was worse, so the flight was postponed, and the first 'air mail' was forwarded to the destination by rail. My Tokyo correspondent tells me that it was intended to renew the project about October 20. Although the original flight had to be abandoned, the stamps are likely to be keenly sought after as souvenirs of the introduction of air mails in the Far East. It seems possible that, as all the first edition of these air stamps had been sold out on October 3, a new issue may have been prepared for the retrial later in the month.

"Two quaint and rather crude air-mail stamps have just been issued in Germany. They are of very modest denominations, 10-pfennig orange and 40-pfennig green, but I have no particulars of the service in connection with which they are used. The stamps are inscribed 'Deutsche Flugpost' (German Flying Post). On the 10-pfennig the design is a winged posthorn and on the 40-pfennig is an aeroplane in flight."

It's an ill wind that blows nobody a bit of good. And so James Parkin, of Bloemfontein, is one of the few who can claim aeroplane bombing as befriending them. Parkin, it appears, enlisted at Capetown in 1916 and later in France was sentenced to death for desertion on the battlefield. Sentence was commuted to five years' penal servitude, and while an escort taking Parkin to prison was waiting at a railway station in Northern France the station was bombed by a German aeroplane. Two men in charge of Parkin and many others were killed outright, and it was at first thought that he had shared their fate. As a fact, though, he escaped, but the shock had evidently done him no moral good, as he promptly set to work and robbed a sleeping soldier at a hostel of Treasury notes and papers, and followed it up by all sorts of other crimes and frauds. These particulars of Parkin's career transpired last week at Westminster Police Court, where he explained how he had mistaken another man's bicycle for his own. Another shock followed in the form of "six months' hard."

WELLS CATHEDRAL is the latest to come into line with the vellum book containing the name, rank and cause of the casualty of every Somerset soldier, sailor and airman who lost his life in the war.

SOMEHOW football gatherings always carry with them just a "sma' wee" suggestion of the rough element—irrespective of the gentle art itself. The mystery is possibly explained by the following little paragraph of a police court report in the Midlands. It is only right that there should be some "place" available where in these days of profiteering and other pastimes man should be able to let off a little excess exhaust steam without incurring, etc., etc. Here's the little par. in question:—

"In a case at Nottingham where a man was charged with using highly objectionable language the magistrate held that a football field was not a public place within the Act and dismissed the summons."



**A Reminiscence of the Flying Meetings at Hendon:  
The one-stringed violinist under the railway arch**



# THE ROYAL AIR FORCE

London Gazette, November 21

## Technical Branch

Flying Officers to be Flying Officers, Grade (B.), from (S.O.):—J. L. Denman; Oct. 18. E. H. Eldridge; Nov. 7 (substituted for notification in *Gazette* Nov. 18).

Sec. Lieuts. to be Lieuts.:—R. B. Dormer; April 2, 1918. W. H. Hoile; Jan. 12 (substituted for notification in *Gazette* July 29).

Pilot Officers to be Flying Officers, without pay and allowances of that rank:—G. N. Coward, P. FitzPatrick; Oct. 1.

Sec. Lieut. J. C. Howard (Sec. Lieut., Lab. Corps.) relinquishes his commn. on ceasing to be employed; Jan. 21.

(Then follow the names of 43 officers who are transfd. to the Unemployed List under various dates.)

Sec. Lieut. (Hon. Lieut.) F. M. V. Earle relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; June 25 (substituted for notification in *Gazette* Feb. 28).

Sec. Lieut. W. G. Shipwright relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Nov. 14.

The initials of Lieut. G. G. Bailey, D.F.C., are as now described, and not G. C., as stated in *Gazette* Oct. 24.

The initials of Sec. Lieut. E. F. Thorpe are as now described and not "E. J.," as stated in *Gazette* of Sept. 12.

The notification in *Gazette* of Sept. 26 concerning A. Clayton is cancelled.

## Medical Branch

(Three officers transfd. to Unemployed List.)

## Dental Branch

(One officer transfd. to Unemployed List.)

## Memorandum

The following Prob. Flight Officers are granted hon. commns. as Sec. Lieuts.:—K. N. Knapp; Jan. 21. R. S. Hudson; Jan. 26.

(Then follow the names of three cadets granted hon. commns. as Sec. Lieuts.)

The following Temp. Hon. Lieuts. relinquish their commns. on ceasing to be employed:—R. W. Everett, M.B.E.; July 31. (Hon. Capt.) E. Fairbrother; Aug. 31. W. R. H. Arnold, J. H. Ekins, F. W. Jecock, H. R. Knight, A. McIsaac, S. J. Norton, R. A. Pomphrett, A. R. Woods; Sept. 16. (One officer transfd. to the Unemployed List.)

London Gazette, November 25

Flight-Lieut. D. F. Massy (T.) is granted a permanent commn. in the rank stated, with effect from Aug. 1.

The notification in *Gazette* Aug. 1 appointing Lieut. R. S. Sorley, D.S.C. (A.), to a permanent commn. is cancelled.

The notification in the *Gazette* of Oct. 28, appointing the following officers to permanent commns. is cancelled:—Sqdn. Ldr. M. E. A. Wright (A.P. (T.)); Flying Officer J. L. Findlay, M.C. (A.).

## Flying Branch

Capt. G. M. Turnbull, A.F.C., is graded for purposes of pay and allowances as Maj. whilst employed as Maj. (A.), from May 1 to June 30.

Capt. W. Lambert is graded for purposes of pay and allowances as Maj. whilst employed as Maj. (K.B.), from May 1 to July 9.

Sec. Lieuts. to be Lieuts.:—H. R. Watterson; May 1, 1918 (since demobilised); T. H. Langrishe; May 10, 1918. W. M. Brewer; Jan. 7. G. S. Smith; March 26. R. C. Morris; June 6 (since demobilised).

The following relinquish their commns. on ceasing to be employed:—Lieut. T. N. Robinson (Lieut., R. Art.); Feb. 11. Lieut. J. F. Gillam (Lieut., R.G.A.); Aug. 20. Sec. Lieut. (Hon. Capt.) C. J. P. Copner (Capt., S. Wales Bord.); Nov. 1. Capt. G. T. Porter (Capt., R.G.A.); Sec. Lieut. (Hon. Lieut.) H. A. Deakin (Lieut., S. Staffs. R.); Nov. 3. Lieut. F. L. Harding (Lieut., Som. L.I.); Nov. 4. Lieut. S. D. Lavelle (Lieut., Manch. R.); Nov. 7. Maj. T. K. Elmsley (Lieut.-Comdr. R.N.); Nov. 8. Sec. Lieut. (Hon. Lieut.) C. W. F. Busk (Lieut., R.E.); Nov. 12.

(Then follow the names of 139 officers who are transfd. to the Unemployed List under various dates.)

The following Lieuts. relinquish their commns. on account of ill-health caused by wounds, and are permitted to retain their rank:—F. H. Hall; June 25 (substituted for notification in *Gazette* of Dec. 20, 1918). E. G. Weller; Nov. 15. C. B. Bateman, J. J. Hickey; Nov. 19.

The following Sec. Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—E. L. Allanson, C. B. Smith; Nov. 18. R. I. Jenkinson; Nov. 19.

The surname of W. F. Grainger is as now described, and not "Granger," as stated in *Gazette* of Oct. 3.

The surname of Sec. Lieut. J. E. Quin is as now described, and not "Quinn," as stated in *Gazette* of Dec. 10, 1918.

The notification in *Gazette* of Feb. 28 concerning Lieut. G. R. Smith (Can. M.G.C.) is cancelled.

The notification in *Gazette* of April 1 concerning Lieut. T. N. Robinson is cancelled.

The notification in *Gazette* of Oct. 28 concerning Lieut. R. Jones is cancelled.

The notification in *Gazette* of Nov. 4 concerning Lieut. E. B. Jones is cancelled.

## Administrative Branch

Flying Officer J. M. Dandy to be Flying Officer from (A.); Sept. 1 (substituted for notification in *Gazette* of Oct. 3).

Lieut. (Hon. Capt.) A. A. J. Poole to be Lieut. (Hon. Capt.) ("A. and S."); Jan. 6 (substituted for notification in *Gazette* of April 4).

Pilot Officer G. E. Pyne to be Flying Officer; Nov. 10.

The following relinquish their commns. on ceasing to be employed:—Sec. Lieut. E. G. Masson (Lieut., Military Accountant Officer); June 12. Lieut. (Hon. Capt.) E. V. Tarrant, D.C.M. (Qrmr. and Capt., Hamp. R.); Sept. 25. Sec. Lieut. J. E. Slattery (Sec. Lieut., Lan. Fus.); Nov. 8. Sec. Lieut. F. C. Peacock, M.C. (Lieut., R.F.A.); Nov. 10. Lieut. A. S. Dark (Lieut., half-pay list); Nov. 17.

(Then follow the names of 37 officers who are transfd. to the Unemployed List under various dates.)

The following Capts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—A. D. Dawson (Capt., R.F.A., T.F.); Nov. 13. G. M. Gordon; Nov. 19.

Lieut. M. Tarbet relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; Nov. 18.

The notification in *Gazette* Nov. 14 concerning Capt. G. A. Revington (Lieut., R.N.) is cancelled.

The notification in *Gazette* July 2, 1918, concerning Sec. Lieut. (Hon. Lieut.) J. W. Harling is cancelled.

The notification in *Gazette* Oct. 21 concerning Lieut. R. W. Dogherty is cancelled.

## Technical Branch

Sec. Lieut. H. L. Bown is graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A.); May 1.

Sec. Lieuts. to be Lieuts.:—M. A. Doyle; April 2, 1918 (substituted for notification in *Gazette* March 7); H. T. H. Copeland; March 4 (substituted for notification in *Gazette* July 29).

Sec. Lieut. (Hon. Lieut.) R. O. C. Bush to be Lieut.; April 2, 1918, without the pay and allowances of that rank prior to Aug. 20, 1918.

Pilot Officer R. West to be Flying Officer, without the pay and allowances of that rank; Oct. 1.

Sec. Lieut. H. M. Lonsdale to be Sec. Lieut. (Grade B.), from (Ad.); July 13, 1918.

Capt. H. W. M. Paul, O.B.E., M.C. (Capt., Midd'x R.), relinquishes his commn. on ceasing to be employed; Nov. 1 (substituted for notification in *Gazette* Nov. 7).

Maj. S. Lambert is temporarily transfd. to Unemployed List; May 17 to June 3.

(Then follow the names of 43 officers who are transfd. to the Unemployed List under various dates.)

The following Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—H. G. Cooper; Nov. 14. J. R. Hovenden, L. F. Jones; Nov. 19.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. S. Forde; Sept. 30 (substituted for notification in *Gazette* Sept. 30). (Hon. Lieut.) C. D. Jackman (Lieut., Norf. R.); contracted on active service; Nov. 11. J. D. Graham; Nov. 19.

The surname of Flight-Lieut. (actg. Sqdn. Ldr.) J. Curtis Watson is as now described, and not "J. Curtis," as stated in *Gazette* Nov. 7.

The initial of Sec. Lieut. F. Wombell is as now described, and not "A.," as stated in *Gazette* May 27.

The notification in *Gazette* May 27 concerning Sec. Lieut. H. L. Brown is cancelled.

## Medical Branch

Transferred to the Unemployed List.—Capt. M. J. Whelton; Nov. 5. Capt. A. W. Weston; Nov. 9.

## Dental Branch

Transferred to the Unemployed List.—Lieut. G. O. Roper; Feb. 19 (substituted for notification in *Gazette* July 1, wherein this officer was shown under Medical Branch); Capt. F. R. McCambley; Oct. 25. Lieut. N. A. Goudge; Nov. 11.

## Memoranda

The following Temp. Hon. Lieuts. relinquish their commns. on ceasing to be employed:—H. J. Foxell, L. J. Hill, A. W. Holden, R. Ross; Sept. 16. (Hon. Capt.) G. R. Groves; Oct. 16. D. M. Anderson; Nov. 8.

The following relinquish their commns. on ceasing to be employed:—Maj. C. S. McNabb (Capt., Cam'n. Highrs.); Capt. T. E. Withington, A.F.C. (Capt., Oxf. and Bucks. L.I.); Nov. 10.

(Then follow the names of 7 officers who are transfd. to the Unemployed List under various dates.)

The notification in the *Gazette* of July 25 concerning Prob. Flight Officer W. E. W. Holder is cancelled.

The notification in the *Gazette* of Sept. 23 concerning Sec. Lieut. R. D. McEwen Hart is cancelled.

London Gazette, November 28

The following officers have been granted short service commns. in the ranks stated, with effect from Nov. 28 (except where otherwise stated). They will retain their seniority in the substantive rank last held by them prior to the grant of the short service commn., except that officers gazetted to a rank lower than their previous substantive rank will be placed at the head of the list of officers of the rank to which they are now gazetted, and will retain seniority relative to each other in accordance with their previous position on the gradation list.

In the case of officers now gazetted Flying Officer from Pilot Officer, seniority will date from the date of the *Gazette*.

Squadron Leader.—J. W. Cordingley, O.B.E. (S.O.).

Flight Lieutenants.—G. M. Bouthfey (A.), H. H. Clarke (S.O.), E. S. Goodwin, A.F.C. (S.), R. A. W. de H. Haig (A.), L. V. Hirst (A.), A. J. Nightingale (A.), H. L. Nunn, D.S.C., D.F.C. (S.), R. L. Stephenson-Peach, M.B.E. (T.).

Flying Officers (from Flight Lieutenants).—R. S. Sorley, D.S.C. (A.) (with effect from Nov. 27); W. V. Simons (S.).

Flying Officers.—D. P. Cameron, M.B.E. (A.), O. W. Clapp (T.), L. A. W. Deane (A.), J. L. Findlay, M.C. (A.), B. Holding (A.), W. R. Rogers (Ad.), E. A. Scales (Ad.).

Observer Officer.—J. S. C. Robinson.

Flying Officers (from Pilot Officers).—A. W. C. Bayes (A.), S. McKeever (A.), G. H. Winckworth (T.).

The notifications appearing in *Gazettes* of the dates indicated below, appointing the following officers to short service commns., are cancelled:—Flight-Lieut. B. E. Catchpole, R.C., D.F.C. (A.), Flying Officer G. A. F. Gibson (T.); Sept. 16. Flight-Lieut. E. F. Turner (T.), Flying Officer R. Clowes (A.), Flying Officer A. G. Lamplugh (A.), Flying Officer W. E. Lowrie (T.), Flying Officer J. Owen, D.F.C., M.M. (A.), Flying Officer J. W. Pinder, D.F.C. (A.), Flying Officer A. R. Thompson (T.); Oct. 24. Flight-Lieut. B. D. Hobbs, D.S.O., D.S.C. (S.); Nov. 11.

The surname of Flying Officer A. C. Townend, A.F.C. (A.), is as now described, not "Townsend," as stated in *Gazette* of Oct. 24.

Sqdn. Ldr. J. C. M. Lowe (T.) is granted a short service commn. with effect from Aug. 1, not Nov. 11, as stated in *Gazette* of the latter date (amended by *Gazette* of Nov. 14).

Flying Officer L. Hamilton, D.F.C. (A.) relinquishes his temp. and short service commn. at his own request; Nov. 28.

## Permanent Commissions

The following promotions are made:—Group Captains.—Wing Comdr. R. Gordon, C.M.G., D.S.O., Wing Comdr. F. V. Holt, C.M.G., D.S.O.; Nov. 1.

Wing Commanders.—Sqdn. Ldr. L. A. Strange, D.S.O., M.C., D.F.C., Sqdn. Ldr. A. S. Barratt, C.M.G., M.C., Sqdn. Ldr. J. R. W. Smyth-Pigott, D.S.O., Sqdn. Ldr. L. Greig, M.V.O., Sqdn. Ldr. A. H. W. E. Wynn, O.B.E., Sqdn. Ldr. G. P. Grenfell, D.S.O.; Nov. 1.

Squadron Leaders.—Flight Lieutenant A. A. B. Thompson, M.C., A.F.C. (Ad.) Flight-Lieut. W. Thomas, M.C. (T.), Flight-Lieut. W. G. P. Young, O.B.E.

(S.O.), Flight-Lieut. R. G. Parry, D.S.O. (S.O.), Flight-Lieut. H. L. Reilly, D.S.O. (A.), Flight-Lieut. C. C. Darley (A.), Flight-Lieut. G. G. H. Cooke, D.F.C., A.F.C. (A'ship), Flight-Lieut. H. R. H. Prince Albert, K.G. (A.), Flight-Lieut. G. S. M. Insall, V.C. (A.); Nov. 1.

**Flight Lieutenants.**—Flying Officer F. Fowler, D.S.C., A.F.C. (S.), Flying Officer J. H. Norton, M.C., D.F.C. (A.), Flying Officer W. B. Farrington, D.S.O. (A.), Flying Officer J. F. Lawson, A.F.C. (A.), Flying Officer V. S. E. Lindop (A.), Flying Officer E. J. D. Townesend (S.O.), Flying Officer R. S. Capon (A.), Flying Officer W. H. Longton, D.F.C., A.F.C. (A.), Flying Officer J. S. Goggin (S.O.), Flying Officer F. M. F. West, V.C., M.C. (A.), Flying Officer R. Halley, D.F.C. (A.), Flying Officer C. J. Brockbank, M.B.E. (T.), Flying Officer A. W. Beauchamp-Proctor, V.C., D.S.O., M.C., D.F.C. (A.), Flying Officer A. Rowan (S.O.), Flying Officer W. H. Ellison (T.); Nov. 1.

The following temporary appointments are made at the Air Ministry:—  
**Staff Officer, 1st Class (Q.).**—Maj. A. L. C. Neame; March 19 (substituted for notification in *Gazette* June 3).

**Staff Officer, 3rd Class (P.).**—Flight-Lieut. W. D. Budgen, O.B.E., from (S.O., 2nd Class); Oct. 30.

The following temporary appointments are made:—Col. (actg. Brig.-Gen.) H. C. T. Dowding, C.M.G., is graded for purposes of pay and allowances as Maj.-Gen. while officiating in command of an area, from April 5 to 25.

**Staff Officer, 1st Class.**—Lieut.-Col. (Hon. Col.) J. M. Home, C.B.E., is graded for purposes of pay and allowances as Brig.-Gen. (Admin.), from April 5 to 25.

**Staff Officer, 2nd Class (Air).**—Sqn. Ldr. C. E. Maude; Nov. 14.

**Staff Officer, 3rd Class (T.).**—Graded for pay at Air Ministry Rates.—Flight-Lieut. T. W. Elmhirst, A.F.C.; Aug. 1.

#### Flying Branch

Wing Comdr. G. W. P. Dawes, D.S.O., to be Wing Comdr. (A.), from Group Comdr.; Oct. 18.

Sqn. Ldr. C. E. Maude to be Sqn. Ldr. (A. and S.), from (S.O.); Oct. 16.  
Flight-Lieut. N. H. Bottomley, A.F.C., to be Flight-Lieut. (A.), from (S.O.); Oct. 18.

Capt. J. C. Croft is graded for purposes of pay and allowances as Capt. while employed as Capt. (A.), from May 1 to Sept. 15.

Lieut. (actg. Capt.) J. C. Cantrill to be Lieut. (actg. Capt.) (A.), from (Ad.); July 26.

**Second Lieutenants to be Lieutenants.**—J. L. Fletcher, D. Martin; Nov. 30, 1918. C. S. Cope; June 13.

Pilot Officer C. F. Kearns to be Flying Officer; Oct. 1.

The following relinquish their temp. R.A.F. comms. on return to Army duty:—Pilot Officer E. M. Matthew (Lieut., R.G.A.); Oct. 13. Flying Officer C. R. H. Firth (Lieut., R.G.A.); Oct. 22. Flying Officer L. H. Forrest (Lieut., Indian Army); Oct. 23. Flying Officer A. G. Grant (Lieut., High. L.I.), Flight-Lieut. L. H. T. Sloan (Capt., Cameron Highrs.); Nov. 7. Flying Officer L. M. S. Essell (Lieut., E. Kent R.); Nov. 8. Flying Officer W. G. B. McKechnie (Lieut., R. Scots Fus.); Nov. 11.

Sqn. Ldr. the Hon. R. Coke, A.F.C. (Lieut.-Comdr., R.N.), relinquishes his temp. R.A.F. comm. on return to Naval duties; Nov. 8.

Sec. Lieut. E. K. Dashwood relinquishes his comm. on ceasing to be employed; Nov. 4.

(Then follow the names of 105 officers who are transfd. to the Unemployed List under various dates.)

Capt. E. W. Leggatt, M.C. (Lieut., Wilts. R.), resigns his comm., and is permitted to retain his rank; Nov. 29.

The following Lieuts. relinquish their comms. on account of ill-health contracted on active service, and are permitted to retain their rank:—H. Booth; Nov. 20. D. Barnett, C. K. Mills; Nov. 21.

Lieut. A. Kiteley (Lieut., R.A.) relinquishes his comm. on account of ill-health caused by wounds; Nov. 15.

Lieut. H. T. J. Hynes (Lieut., R.G.A.) resigns his comm.; Nov. 29.

The following Sec. Lieuts. relinquish their comms. on account of ill-health caused by wounds, and are permitted to retain their rank:—R. A. Clarke; Oct. 14. G. H. Carr; Nov. 15. J. Turnbull; Nov. 20.

The following Sec. Lieuts. relinquish their comms. on account of ill-health, and are permitted to retain their rank:—E. O. Korner; Nov. 20. W. H. Cox; Nov. 21. R. Lazzari (contracted on active service); Nov. 22.

Sec. Lieut. K. B. Terry resigns his comm.; Nov. 29.

Sec. Lieut. W. A. Grant is antedated in his appointment as Sec. Lieut. (A. and S.) to June 28, 1918.

The surname of Lieut. R. S. Buller is as now described, and not "R. S. Butler," as stated in *Gazette* of Oct. 24.

The notification in *Gazette* of Aug. 29 concerning Sec. Lieut. W. Emery is cancelled (notification in July 4 *Gazette* to stand).

The notification in *Gazette* of Sept. 2 concerning Sec. Lieut. C. F. Williams is cancelled.

The notification in *Gazette* of Oct. 3 concerning Lieut. W. R. Eastman is cancelled (notification in Aug. 5 *Gazette* to stand).

The notification in *Gazette* of Nov. 11 concerning Sec. Lieut. J. F. M. Phillips is cancelled.

The notification in *Gazette* of Nov. 21 concerning Sec. Lieut. E. K. Dashwood is cancelled.

#### Administrative Branch

Maj. (actg. Lieut.-Col.) R. J. F. Barton, O.B.E., relinquishes the actg.

rank of Lieut.-Col. on ceasing to be employed as Lieut.-Col., from (S.O.); March 3 (substituted for notification in *Gazette* of Nov. 7).

Flight-Lieut. G. T. Tait to be Flight-Lieut., from (S.O.); Aug. 8.

Flight-Lieut. A. H. Strading to be Flight-Lieut., from (S.O.); Oct. 20.

The following Lieuts. are graded for purposes of pay and allowances as Capts., whilst employed as Capts.:—A. Webb; May 1 to July 25. (Hon. Capt.) G. H. Hill; June 28 to Sept. 26.

Flying Officer (actg. Flight-Lieut.) J. C. Cantrill relinquishes the actg. rank of Flight-Lieut. on ceasing to be employed as Flight-Lieut., from (A.); Aug. 29.

Pilot Officer F. W. Sinclair to be Flying Officer; Aug. 21.

J. M. Andrews is granted a temp. comm. as Sec. Lieut.; Oct. 25, 1918.

The following relinquish their temp. R.A.F. comms. on return to Army duty:—Flying Officer E. King (Lieut., R. Ir. Regt.); Oct. 6. Flying Officer (Hon. Flight-Lieut.) A. E. Miller, M.C. (Capt. W. Rid. R.); Nov. 15.

(Then follow the names of 20 officers who are transfd. to the Unemployed List under various dates.)

The notification in *Gazette* of Oct. 24 concerning Sec. Lieut. A. H. Black is cancelled.

The notification in *Gazette* of Sept. 26 concerning Flying Officer J. C. Cantrill is cancelled.

The notification in *Gazette* of Nov. 18 concerning Sec. Lieut. C. O. D. Kidd is cancelled.

#### Technical Branch

Flight-Lieut. (actg. Sqn. Ldr.) J. C. Watson relinquishes the actg. rank of Sqn. Ldr. on ceasing to be employed as Sqn. Ldr., Grade (B.); Oct. 22 (substituted for notification in *Gazette* of Nov. 7).

Lieut. L. F. Peaty is graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A.) (from May 1 to July 25).

Lieut. J. W. Gardener to be Lieut., Grade (A.), from (Ad.), and is graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A.); May 20.

Lieut. S. D. Carpenter to be Lieut., Grade (B.), from (A.); Nov. 18, 1918 (substituted for notification in *Gazette* of Dec. 24, 1918).

Flying Officer J. W. Gardner relinquishes the grading for pay and allowances as Flight-Lieut. on ceasing to be employed as Flight-Lieut., Grade (A.); Oct. 11.

**Second Lieutenants to be Lieutenants.**—J. K. Shrimpton; Oct. 13, 1918, without the pay and allowances of that rank prior to Dec. 1, 1918 (substituted for notification in *Gazette* of April 11 and May 23); J. B. Donald; Feb. 24. F. Denham; March 13 (substituted for notification in *Gazette* of Sept. 19). E. R. Beckwith; April 2, 1918, without the pay and allowances of that rank prior to March 15. W. J. Maley; June 22.

**Pilot Officers to be Flying Officers.**—F. A. Cherry, J. Turner, W. Wheatley; Oct. 1.

Pilot Officers to be Flying Officers without the pay and allowances of that rank:—F. H. Cashmore, S. A. Conway, C. Dollery, T. F. Emms, D. Y. Mattinson; Oct. 1.

Capt. T. Goulbourn relinquishes his comm. on ceasing to be employed; Nov. 6.

(Then follow the names of 40 officers who are transfd. to the Unemployed List under various dates.)

The notification in *Gazette* of Sept. 23 concerning Pilot Officer A. Robinson is cancelled.

The notifications in the *Gazettes* of Aug. 5, Sept. 16, and Oct. 24 concerning Flying Officer J. W. Gardiner are cancelled.

The notification in the *Gazette* of July 15 concerning Lieut. C. H. Knight is cancelled.

#### Medical Branch

Capt. (Bt.-Maj.) F. C. Cowtan, R.A.M.C., is granted a temp. comm. as Sqn. Ldr. on seconding to the R.A.F.; Sept. 1.

**Flying Officers to be Flight Lieutenants.**—S. E. Duff; Aug. 27. A. Parker; Oct. 5. T. D. J. A. Fuller; Oct. 17. E. T. McElligott; Nov. 4. D. C. Farquharson; Nov. 14. J. T. T. Forbes; Nov. 15. J. W. Healy; Nov. 18. M. J. Smyth; Nov. 20.

Capt. C. T. Costello relinquishes his comm. on account of ill-health, and is permitted to retain his rank; Nov. 21.

#### Dental Branch

**Flying Officers to be Flight Lieutenants.**—N. A. Goudge; Oct. 8. W. Inman; Oct. 25. L. S. Kettlewell; Oct. 31. W. J. Singleton, J. Smith; Nov. 11. J. Jones, J. Wren; Nov. 15.

#### Memoranda

(Then follow the names of two cadets granted temp. comms. and five cadets granted hon. comms.)

Capt. T. E. Longridge, O.B.E. (Capt., R.A.S.C.) relinquishes his temp. R.A.F. comm. on return to Army duty; Nov. 6.

The following temp. Hon. Lieuts. relinquish their comms. on ceasing to be employed:—F. Dawson, R. G. Underwood; Sept. 16.

(Then follow the names of four officers who are transfd. to the Unemployed List under various dates.)

Hon. Sec. Lieut. F. Smith relinquishes his hon. comm.; May 1.

Capt. G. H. A. Hawkins (Capt., Manch. R., T.F.) relinquishes his comm. on account of ill-health caused by wounds, and is granted the rank of Maj.; Nov. 17.

## Air Policy in U.S.

THE United States Secretary of War recently announced upon the recommendation of the Joint Army and Navy Board on Aeronautics, that the following policy in regard to the use of aircraft by the American naval and military forces had been approved by him and by the Secretary of the Navy, and was therefore published for the information and guidance of all concerned:—

1. Aircraft operated in conjunction with either military or naval forces shall be military or naval aircraft, respectively, and under the command of the respective military or naval commanders.

2. Both the Army and Navy shall confine the use of their aircraft to activities clearly connected with strictly military or naval functions as such are defined by existing laws and agreements.

3. To prevent duplication, and secure co-ordination, plans of new projects for the construction of aircraft, for experimental stations, for coastal operating stations, or for extensive additions thereto, shall be submitted to the Joint Army and Navy Board on Aeronautics for recommendations.

4. In the interests of economy, heavier-than-air craft shall

be used instead of lighter-than-air craft whenever the former can perform satisfactorily the required work.

5. Whenever possible, training and other facilities of either Service shall be made available for, and used by, the other.

6. Each Service before entering the market shall attempt to secure aircraft of the type desired from or through the other Service.

7. As soon as any experimentation is inaugurated, all information pertaining thereto shall be exchanged between the Army and Navy Air Services.

8. All estimates for the Army and Navy programmes shall be presented to the Joint Army and Navy Board on Aeronautics for review and recommendation before submission to Congress.

9. Functions of Aircraft.—(a) Army: For offensive and defensive work in the field in conjunction with the various arms of the Service. For general purposes of fire-control and fire-control information in connection with the coast defence. (b) Navy: For use from coastal stations for convoy, reconnaissance, and patrol. For use from war vessels, bases, and carriers for reconnaissance and spotting, and for offensive operation against enemy vessels and naval bases.



# Personals

## Roll of Honour

The War Office announced on November 1 that Lieut. P. C. ELLIS, High L.I., att'd. R.F.C., Sec. Lieut. D. M. PAGE, R.F.C., and Lieut. E. H. P. STREATHER, R.F.C., who were previously reported missing, are now reported killed.

THE War Office announced on November 27 that Sec. Lieut. S. E. Raper, Seaf. Highlanders, att'd. R.F.C., who was previously reported missing, is now reported killed.

## Married

NORMAN WREFORD BIRKETT, late 6th Batt., The Buffs, and R.A.F., son of Mr. and Mrs. Louis Birkett, of Chislehurst, was married on November 25, at St. Stephen's Church, Ealing, to KATHLEEN WELLS, late W.R.A.F., daughter of Mr. C. W. Wells, of Ealing.

Flight-Lieut. ROBERT JOHN ORTON COMPSTON, D.S.O., D.F.C., R.A.F., was married on November 25, at St. Simon's Church, Chelsea, to NINA MABEL, only child of the late Capt. A. H. BARCLAY and adopted daughter of Lieut.-Col. H. F. Barclay, 34, Lennox Gardens.

Capt. A. H. E. LINDOP, M.C. and Bar, 37th Dogras, Indian Army, att'd. R.A.F., elder son of Lieut.-Col. A. H. Lindop, late Royal Dublin Fusiliers, was married on November 29, at Westminster Cathedral, to Miss IVY GERTRUDE LEVASSEUR, elder daughter of Mr. E. Levasseur, of Frinton, Pinner.

Air-Commdr. T. I. WEBB-BOWEN, R.A.F., was married on November 27, at Christ Church, Chelsea, to VIOLET LOUISE HADLEY, elder daughter of Mr. and Mrs. C. A. Hadley, of Johannesburg, S. Africa.

Capt. C. B. WILSON, M.C., late Xth Royal Hussars and R.F.C., and Mrs. HUGH ORR-EWING were married on Saturday, November 22.

## To be Married

The engagement is announced between Capt. C. C. CLARK, R.F.A. and R.A.F., youngest son of Mr. Henry Clark and the late Mrs. Clark, of 25, Adelaide Crescent, Brighton, and KATHERINE, eldest daughter of Mr. and Mrs. P. HERBERT COATS, of Corsebar, Paisley.

The engagement is announced between Eng.-Lieut.-Commdr. REY GRIFFITH PARRY, D.S.O., R.N. (acting major, R.A.F.), son of the late W. Griffith Parry, formerly of Grosvenor Lodge, Beckenham, and Belgrano, Buenos Aires, and JOAN BRUNNER BUCKLEY, younger daughter of Maj. T. W. Buckley, R.A.M.C., Clopton Manor, Thrapston, and of Mrs. Buckley, The Ridge House, St. George's Hill, Weybridge.

The wedding of Lieut.-Col. RUSCOMBE SMYTH-PIGOTT, D.S.O., R.A.F., and Lady CLARE FEILDING will take place at Newnham Paddox, Lutterworth, on Tuesday, December 30, at 10.30.

## Items

On landing at Portsmouth, on December 1, the PRINCE OF WALES was received by the Prince Albert, the Commander-in-Chief, Portsmouth, the General Officer Commanding, Southern Command, and the Air Officer Commanding, Coastal Area, and by the Hon. Sir Sidney Greville (Comptroller of his Household).

The will of Maj. JAMES THOMAS BYFORD MCCUDDEN, V.C., D.S.O. (and Bar), M.C. (and Bar), R.F.C., M.M., of Kingston-on-Thames, killed in France accidentally, has been proved at £266.

The will of Maj. EVELYN NEVILLE LEWIS WHITE, R.A.F., of Tintagel, has been proved at £683.

## AVIATION IN PARLIAMENT

### Civil Aviation

MAJ. GLYN, in the House of Commons, on November 25, asked the Secretary of State for War whether the Government contemplate assisting the industry engaged in civil aviation by any of the suggested methods contained in Section III of the Air Ministry's Synopsis of Progress of Work in the Department of Civil Aviation (Cmd. 418)?

Capt. Guest (Joint Parliamentary Secretary to the Treasury): Indirect assistance by the provision of key aerodrome and shed accommodation, the collation and issue of information and the provision of communications is being afforded to civil aviation. The question whether any further action is necessary is under consideration.

### Royal Air Force: Airship Service

Lieut.-Comdr. KENWORTHY, on November 26, asked the Under-Secretary of State for the Air Ministry how many large rigid airships are now in commission; how many large rigid airships are under construction; how many large airship sheds are in use; and how many have full staffs and crews in attendance for handling airships; and what is the estimated total cost next year of the Airship Service, rigid and non-rigid, for the Royal Navy?

Mr. Churchill: The reply to the hon. and gallant gentleman's first question is that there is one large rigid airship (R 34) in commission for the Navy, and that two (R 32 and R 33) are being maintained temporarily, pending a decision as to the most advantageous method of disposing of them.

The reply to the second question is that the construction of R 38 is proceeding under an arrangement for her sale, when completed, to the Government of the United States of America. A certain amount of work is being done on three other ships, pending the issue of negotiations for their use for commercial purposes.

The reply to the third question is that the large airship sheds in use are five in number, at Pulham, East Fortune and Howden. It is intended to retain permanently for service purposes the airship station at Howden with two large sheds. The reply to the fourth question is that none of the airship stations have full staffs and crews.

The reply to the fifth question is that the Estimates for the Airship Service are included in the general Estimates for the Royal Air Force, and that these latter being still under consideration no figure can be given. Even when the Royal Air Force Estimates are passed, it is not intended to show separate estimates for the airship side of the Air Force, because the personnel of the different branches will, to some extent, be interchangeable within the Service.

### R.A.F. and Government Policy

MAJ.-GEN. SEELY (by Private Notice) asked the Prime Minister whether the Air Policy of the Government in respect to the Air Ministry is the same as it was on November 14, 1917, when the present Lord Privy Seal stated that the whole of the Air Service must be independent of either the Admiralty or Army Council; why the Secretary of State for War is now President, both of the Army Council and the Air Council, and whether the Air Council is now independent of, or dependent on the president of the Army Council?

The Prime Minister: I regret that my right hon. friend did not see his way to put notice of this question down on the Paper. Nothing has arisen in the course of the last two days which was not in existence before, and, therefore, notice might have been given. I will, however, do my best to answer, as far as I can, in the short time at my disposal.

It has already been stated that there is no change whatever in the Air Policy of the Government, which remains the same as it was when my right hon. friend accepted the position from which, to my regret, he has recently retired.

Maj.-Gen. Seely: May I ask the Prime Minister how he can say that there is no change in the policy of the Government as announced by the Lord Privy Seal when he said that the Air Ministry must be independent of the Admiralty and the Army Council; further, will he give an opportunity to this House to express its opinion on a change of policy from a decision which was so strongly endorsed by his own colleagues?

The Prime Minister: The Army Council has no control whatever over the Air Force—none. It is perfectly independent of the Army Council.

Lord H. Cecil: Not of the President of the Army Council.

The Prime Minister: That is the Secretary of State for War, who holds both positions. That has been done many times in the history of this country, and it is thought desirable in this case. With regard to the latter part of my right hon. friend's question, I have already said, in answer to my noble friend, that if there is a general desire on the part of the House for a discussion of the subject, the Government will find time—[Hon. Members: "No, no!"]—but I would point out that the pressure of business is very great, and we do not wish to allocate time unless there is a general desire on the part of hon. members.

Lord H. Cecil: Will the Prime Minister consider whether a few hours or half a day would not be quite sufficient for this purpose; has not recent experience shown that there is often half a day at the disposal of the Government, if they cannot promise a whole day, and could we not have a friendly arrangement that half a day should be assigned, without any inconvenience to the Government, to give the Government an opportunity of explaining to the House the rather metaphysical obscurities which have arisen?

### Aircraft Supplies

LIEUT.-COL. SIR F. HALL on December 1 asked the President of the Board of Trade if he has had his attention drawn to the great efforts which are being made by American trading interests, with the United States Government's co-operation, to develop the South American markets for aircraft supplies and aircraft transport undertakings; and if he will state what is being done by the British Government in the same direction with a view to stimulating this important industry in this country?

Sir A. Geddes: The answer to the first part of the question is in the affirmative; as regards the second part of the question, several important British aircraft firms already have their representatives in a number of the South American Republics, and His Majesty's diplomatic and commercial representatives in those countries are assisting, and will continue to assist, them as far as lies in their power. British firms in this country are being kept in touch with developments, information concerning which is unlikely to reach them through their local representatives.

### Anti-Aircraft Station, Putney Heath

MR. LORDE asked the Secretary of State for War why the anti-aircraft station at Putney Heath on and adjoining the Metropolitan Water Board's reservoir is still continued, seeing that the urgent need has ceased to exist for over twelve months, in view of the danger to the health of the metropolis caused by the very dirty and unsatisfactory state of the station?

Mr. Forster: It is proposed to maintain these headquarters, though not necessarily on the present site, as part of the permanent scheme of anti-aircraft training. Until a new permanent site has been acquired no other accommodation is available for the personnel, stores and equipment.

### Russia—General Denikin

LIEUT.-COL. MALONE asked the Secretary of State for War if he will state the number of aeroplanes supplied to General Denikin, K.C.B.; the number of officers and men, late of the Royal Air Force, now serving with his forces; and the date on which it is proposed that this force should return to England?

Capt. Guest: The answer to the first part is that 277 aeroplanes have been sent to the forces serving with Gen. Denikin. In regard to the second part, it is assumed that the hon. and gallant member desires to know the number of officers and men still on the strength of the Royal Air Force serving with Gen. Denikin's armies. There are at present 101 Royal Air Force Officers and 300 airmen serving with these armies. The reply to the third part is that these troops, all of whom volunteered for this service, are to be maintained up to March 31, 1920, but the actual date of their withdrawal has not yet been settled.

## “AVIATION AND WORLD TRANSPORT”

THIS was the subject chosen by Lord Montagu of Beaulieu for a most instructive address before the members of the British Women's Patriotic League on Monday last.

Lord Sydenham, who presided, said our future safety depended on how we handled the problem of the air. If we were to trust to the League of Nations and neglect the air we should be courting disaster. In any future war aviation would be the dominant factor.

After summarising the wonderful progress made in aviation by this country in recent years, particularly during the War, Lord Montagu remarked that since the Armistice all kinds of new “records” had been set up. He had been believed to be perfectly mad when, in a lecture he delivered in India, he had said that it would be possible to fly from London to Delhi. That feat had since been accomplished, and he saw no reason why flights should not be made from Delhi to Australia if suitable landing-places, supply bases, etc., were provided.

He pointed out that at the outbreak of war we had only 270 aeroplanes, and the War Office had confessed that only about 40 were fit to fly, but the news conveyed by the latter did more than anything else to save the original Expeditionary Force from being encircled. At the end of the War the number of aeroplanes of all types had grown to over 20,000, while the personnel of the Air Force was bigger than that of the Navy. There were at that time over 30,000 young pilots willing to undertake more risks than could be undertaken in any other form of service.

Turning to the subject of progress in aviation since the Armistice, Lord Montagu pointed out that the London-Paris air services had been in operation now for five months, and 95 per cent. of the journeys begun had been finished at an average speed of 105 miles an hour. That was a very wonderful performance, and eclipsed all the records of the early days of railways or motor-cars. The great danger to the British Empire lay in the length of its lines of communication. We were by sea 6,000 miles from India, 5,000 miles from the Cape, and 2,000 miles from Canada. It was vital to us in time of war that all those sister nations of ours should be linked up with the central head of the Empire in this country. Every hour that we could shorten the lines of communication we strengthened our position, and if we could go to India in three days instead of three weeks we added to our strength. Aviation was going to be a great source of strength, but only if we realised that it was very vital to the Empire, and not a matter to be put under any other Department.

Dealing with the conveyance of mails by aeroplane, people often thought that the use of aeroplanes for mail-carrying was going to interfere with the postal arrangements. He did not believe that. The interference would be with the telegraphic arrangements. He did not know whether any of them had tried to send a telegram to Paris, but a person was very lucky if he got a telegram delivered there in six hours. When he was in India he sent a telegram which took ten days to reach England. Aviation was going to hit the cable company. Telegrams from India were sent at the rate of 12 annas (or 1s.) per word, and the time occupied was five or six days. By aeroplane a message of 5,000 words, written on paper weighing one ounce, could be carried for

5s. for those distances. Even if extra cables were laid, and the company were able to transmit messages in 24 hours, they could still get a letter through by aeroplane in three days. Then there was the conveyance of newspapers. They would be able to have the English newspapers in India three or four days after they were printed. It was possible that they would have to pay 1s. for *The Times* instead of 3d., but people would be delighted to pay that for a good newspaper. When he was in India he would have been delighted to have paid anything to keep in touch with what was going on at home.

Lord Montagu gave it as his opinion that the mail between this country and India was more likely to be carried by airship than by aeroplane. Fifty per cent. of the total lift of a big airship was available for a useful load. During the War British airships flew 2,500,000 miles, chiefly engaged in protecting convoys and in scouting over the North Sea. That was a wonderful performance, and the ratio of loss and breakdown was very small indeed.

Lord Montagu then referred to the resignation of General Seely and the probable future of the Air Service. He said he was not going to say for a moment that his own opinions were right, but he did say that the question whether the Air Service in future should be independent or under the War Office or the Admiralty, either separately or jointly, was a question of the greatest importance to this country. It was generally admitted that the independence of the Air Service grew out of the fact that it was found impossible to work it under another Government Department. What had induced the Government now to alter that opinion he did not know and he regretted it. He wanted to point out that unless we retained the nucleus of an independent organisation it would go very hard with us on the outbreak of the next war. While we wished to see a strong League of Nations, our real security was a strong right arm. Let us pray for peace, but there was no good in being dependent on another nation's good will. Whatever our treaty might be with Germany, we all knew that we could not prevent her from building up a large air fleet. She might do it for commerce or for internal communications. Every weight-carrying aeroplane could carry bombs. He asked them to think what would happen if Germany suddenly sent over 10,000 aeroplanes, practically without any declaration of war. London would be a heap of ashes; most of our shipping might be sunk. It was a far too serious matter for us to play with. We must have a Minister separately responsible to this country and the House of Commons for its efficiency.

He did not care whether we spent £100,000 or £10,000,000; it must have an independent existence. The general attitude of the War Office and the Admiralty had been deplorable. They had been much more concerned in scoring off each other than in winning the War.

We could not operate the Fleet without aeroplanes. A fleet with eyes could avoid or accept battle when it chose. A fleet without aeroplanes was a blind fleet. As to the Army, he asked them to inquire what any gunnery officer could have done without the aeroplane. The Navy and the Army were much more dependent on the Air Force than the Air Force was on the Navy and Army.

### British Aircraft Competitions, 1920

OWING to the representations made by British aircraft manufacturers the Air Ministry has decided to alter the date of the commencement of the Small Type Aeroplane Competition to June 1, 1920. Entries for this competition will, therefore, not close until February 1, 1920. The dates already announced in connection with the other two competitions will remain the same.

Both of the aeroplane competitions will take place at the *Aeroplane Experimental Station*, at Martlesham Heath, near Woodbridge, Suffolk.

The *Seaplane (Amphibian) Competition* will take place at Felixstowe, with the exception of the tests for landing upon and rising off the ground for this class, which will be held at Martlesham.

### A New Airco Passenger Machine

PROFITING by the practical experience gained on the London-Paris route, the Aircraft Manufacturing Co., Ltd., are engaged upon the construction of a new aeroplane—the Airco 18—designed for use in the service of the various

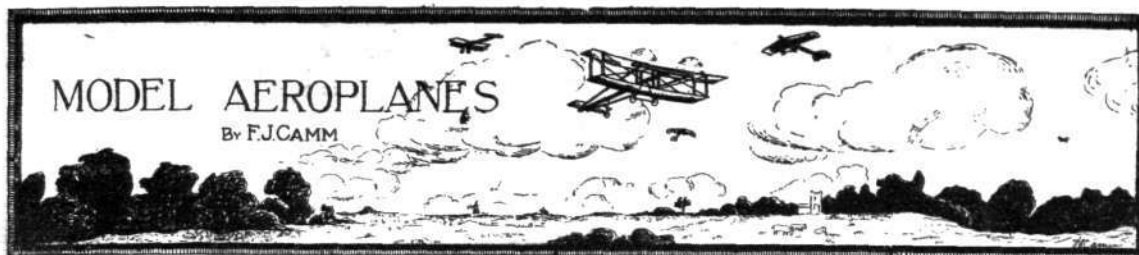
European airways. This machine will carry eight passengers in a luxuriously appointed cabin; while it will be possible, quite easily and rapidly, to remove the seats from the cabin and find accommodation for about a ton of mails. The motor used will be a 450 h.p. Napier Lion, and it is anticipated that when fully loaded the machine will fly at a speed of 114 miles an hour.

### Wireless Telephones on London-Paris Air Route

IN connection with the daily flying of the Airco mail-carrying aeroplanes between London and Paris, an improved wireless telephone installation is to be placed on the roof of the seven-storey building in Westminster which is now the headquarters of Aircraft Transport and Travel. By this means it will be possible to receive messages from pilots while they are actually in flight between London and Paris.

In the head offices of the company in London will be installed a special map of the continental routes, with small model aeroplanes attached to it; and the position of these aeroplanes can be changed by the wireless operator on the roof, according to the messages he receives.





NOTE.—All communications should be addressed to the Model Editor.

### Retrospective

In setting out to renew the model pages of this journal, there are three things which it will be advisable to bring to the reader's notice in order to refresh his memory; firstly, the progress of those interesting years prior to the continental argument, secondly the work which was done during the War, and lastly the prospect of the subject in the future.

Prior to the War about 60 model clubs existed in this country. Most of them were content to strive for distance or duration, and an examination of their reports as published in these pages leads one to the conclusion that no concerted effort in any particular direction formed part of their curriculum. Not more than three of them undertook the construction of gliders, and many of them enjoyed an ephemeral existence only to fizzle out after the initial glamour of inauguration had worn off. The records created in those days by Slatter, Louch, Houlberg, etc., still stand officially, although the writer has succeeded unofficially in beating Slatter's record of 2 mins. 49 secs. by a performance of 3 mins. 19 secs. The Kite and Model Aeroplane Association, with the indefatigable Secretary—W. H. Akehurst—did much to encourage model aeroplaning in those days by the many prizes it offered. With the return to civil life of many of its most active protagonists, there is every indication of a resuscitation of model aeroplaning from the semi-torpor occasioned by the War. Will the K.M.A.A. be reformed to represent its interests as it formerly did? Since the Association is an adjunct to the Royal Aero Club, surely it is within the aegis of the latter society's business to see into this matter. I understand there is difficulty in obtaining a secretary, and, should this be so, I am prepared to act in an honorary capacity *pro tem*.

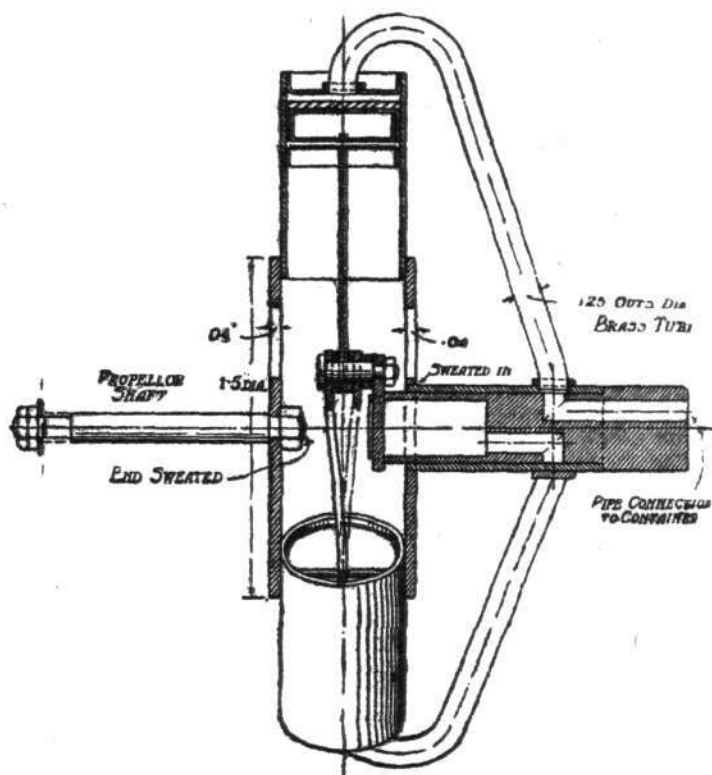
The moribund War-period did not witness a great amount of endeavour, owing to the demands of the Army, and it is, therefore, easy to bridge the interim to the present time. From the correspondence I receive, there are indications of the reformation of the clubs, and a fillip is needed in the way of a competition; anent this I shall have more to say next week. To the clubs I would say: 1. Do not encourage the flying stick-element too much; and 2. Charge an entrance-fee commensurate with a programme of promising proportions. Moreover, it is essential to keep records of results achieved, and we shall be pleased to publish any item of merit submitted to us.

Model ornithopters and helicopters have not received much attention, and I certainly think this subject should be taken up by the clubs. As in the past, so now the latter may depend upon our support. I appreciate that it is necessary, if this feature is to be a success, to be in touch with the whole movement, and I would ask all those readers interested in models to acquaint me with their work, or to write me upon any matters as to which they are in quandary. Such querists may be certain of a reply to the fullest extent of my capacity and knowledge of the subject.

### Compressed Air

There are many indications that compressed air as a motive power for model aeroplanes bids fair to equal in popularity the elastic motor which has practically held the field since its introduction by Penaud about 1870. Although compressed-air models have created performances almost as good as those obtained with rubber motors (71 secs. appears to be the highest record for compressed air to date), elastic has yet to be beaten with regard to the power-to-weight ratio. There are, however, certain models that it would be impracticable to propel by elastic—particularly large machines, where the quantity of elastic would be so great that (even if geared) the length of flight would be too short for any information to be garnered from it. Such models can be driven by compressed air; but there is a disadvantage common to both forms of power, viz., the power is not constant. With the rubber motor as the turns on the elastic skein in torsion grow less, the power proportionately decreases. So with compressed air the pressure in the con-

tainer grows less, with the result that the model has a tendency to helicopter at first, and when the initial thrust has dropped it appears to be under-elevated. Unlike elastic, however, this tendency can be eradicated to a certain extent by means of a reducing valve. Contrary to the prognostication of



others, I have obtained better results with rotary compressed-air engines than with stationary, and I show a side elevation of the engine with which I have experimented, and embodying the Camm sleeve-valve. I have found that a three-cylindered engine of  $\frac{7}{8}$ -in. bore is sufficient to efficiently propel a 30-oz. model. A piston-type reducing valve was used, drawings of which will be given subsequently. It was found best to so arrange the inlet parts in the sleeve and shaft that inlet commenced  $45^\circ$  of crank after reaching top dead centre. It would be interesting to hear the experiences of others in this matter.

With regard to power-driven hydroplanes, the floats could conveniently be made of sheet copper or brass and so form the container for the engine. With regard to other forms of power the steam (flashboiler) type has given by far the best results. Stanger and Meyer have both produced successful petrol motors, the only drawback being that the smallest petrol motor necessitates the construction of too large a machine to be conveniently transported.

### The Classes of Models and Their Uses

Model aeroplanes may be divided into three classes. I refer, of course, to machines provided with motors as distinct from gliders, and all models belong to one or other of these. First, we have the scale model, which reproduces in miniature, with a degree of exactness depending upon the possibilities of the scale, a full-size machine either actually built or in contemplation.

The uses of such models depend upon the object with which they have been constructed. When they are reproductions of existing machines they are intended for exhibition purposes or for demonstrating in technical classes the functions of the various parts. When scale models are built which have been copied from no existing prototype, the object of the builder is usually either to embody some new invention

into the design, to test some method of construction mechanically, or with the object of interesting financiers in a new type and explaining new theories more graphically than could be done without such model.

Models of the second class are those which, although making some pretence to resemble a full-size machine, are also intended for actual flight. These are more often than not the most useless of models, for they do neither the one thing nor the other well. If their motor arrangements are so changed as to render them capable of flight they do not as a rule fly well or for any great distance, whilst the more closely they resemble the prototype the more inferior are their flying qualities. These remarks apply more particularly to models of existing machines, and to models which, in all their general structural forms, are designed on full-size lines.

The use of such models is merely that of pleasing the eye. They are more ornamental than useful, since they teach nothing relating to the laws governing dynamic flight, which could not be learned in a better manner from a more simply and scientifically constructed machine. At the same time, the flying scale model is, or appears to be, the most popular, although most amateurs who build it care more for its fairly correct appearance than they do for its flying abilities.

The third class is the long-distance flyer or racing machine, which has been described as the "freak" type. Freak it more often is judging by the generally accepted standard of proportion in large machines. There are some long-distance flyers which approximate very closely to the lines of possible full-size aeroplanes, but, nevertheless, they are designed for flight, and flight only.

Generally speaking, the monoplane type has been more in evidence than the biplane, and although there are doubtless some authorities in the model world who will disagree with me, I think that it is this type which will survive. It has been well demonstrated that whatever the biplane model can do the monoplane can do equally well, and oftentimes better. The fact that large surfaces are unnecessary on the racing model renders at least one of the main planes of the biplane superfluous; indeed, I have known machines fitted with two planes to fly better when one of them with its stanchions and

braces has been removed, thus showing that the head-resistance of the extra plane with its supports and the impaired sweep of both was detrimental to the lift of the whole when driven forward in flight.

Suppose we have a machine weighing 60zs., and surface it at the rate of 20 sq. ins. to the ounce for the main plane, we should have an area of 120 sq. ins. Now, it would be absurd to place this into biplane form, since in a monoplane surface it represents a plane of, say, 24 ins. by 5 only. The effect of such a low surface-to-weight rating is a considerable reduction in propeller slip with a consequent increase in the amount of forward movement of the machine at each revolution of the propellers, resulting in a greater flight distance.

It may be argued that the flight distance of a biplane with double this amount of surface would be increased to equal that of our supposititious monoplane simply by increasing the power and diameter and pitch of propellers, but the reply to this would be that if this is possible with the biplane the same expedient could be adopted with the monoplane with a yet further improvement in the length of flight; always bearing in mind, of course, that by increasing the power and the size of the propellers we increase the weight, and consequently alter the weight-to-surface rating. I think it quite possible that we shall come, in the near future, to still smaller surfaces, perhaps to 10 or even 8 ins. to the ounce, which latter figure is, after all, slightly less than 1 lb. to the square foot (9 ins. to the ounce is 1 lb. to 1 sq. ft. exactly).

The only difficulty which I foresee is that of obtaining sufficient lateral stability owing to the shortness of the span, but this can be met in machines with the well-known triangular framework by doing away with the central portion of the plane and placing what would virtually be two planes, one out on each side of the framework. Or if the frame is of the single centre stem type, by placing the plane a little above the frame. The fact of the centre of the thrust line of the propellers being below the plane would make little or no difference with such a small surface as would be used, since the head resistance of motors and frame would probably exceed the head resistance and drift of the plane.

(To be continued.)

## "The Design of Model Aeroplanes"

FOR years those who have made a hobby of making and flying model aeroplanes have wished for a text-book to help them in their work, and now Mr. F. J. Camm has stepped into the breach. He has tackled the subject from the theoretical as well as the practical standpoint, and bearing in mind the many years he has given to the building and flying of models, his book may well become in time the standard one on the subject.

The opening chapter is given up to explaining how an aeroplane flies and in the next two or three chapters Mr. Camm goes into the question of design, and also explains some methods of construction. Thereafter he describes various types of models, and by the aid of the very clear drawings it should be possible for any reader to construct any one which his fancy may lead him to select. Then follow useful chapters on the theory, design and making of airscrews, the construction of compressed air motors, the flying of models, the running of a model aero club, the building and flying of a full-size glider, etc.

In a foreword, Mr. F. Handley Page points out that model aeroplanes are not toys, but scientific instruments, and it is, therefore, possible to combine an interesting sport with the fascinating study of the science of aeronautics. After pointing out the important part which aircraft must play in the commercial and national interests of all nations,



## An Aero Club for Queensland

PRELIMINARY steps were recently taken to form a Queensland Aero Club. Mr. J. J. Knight was elected provisional chairman, and Capt. E. H. Rydon secretary and treasurer. An inaugural dinner was held on November 5.

## Double Fatality in Holland

A RUMPLER machine caught fire while flying near Soesterberg on November 24, and the two occupants, Lieut. M. C. van Dyk and Lieut. C. Land, were both killed, the machine falling from a height of 1,200 ft. This is the fourth fatal accident with German machines in Holland since May.

## Seaplane v. U-Boat

BEFORE Sir Henry Duke, President of the Prize Court, the story of a fight between a British seaplane and a German submarine was revealed on November 25. Capt. C. E. S.

Mr. Page says that no more certain way of acquainting oneself with the alpha and omega of aeronautics exists than the making and flying of model aeroplanes. And to attain that object one could hardly have a better guide than Mr. Camm's book, which forms an admirable Christmas present. It is published by Messrs. Benn Brothers at the price of 7s. 6d.; it can be obtained from FLIGHT offices for 7s. 10d. post free.

## Model Aeroplane Supplies

WHETHER they wish to obtain materials and fittings in order to build their own models, or to obtain a complete model, ready to fly, those who visit the showroom of Messrs. A. E. Jones, Ltd., at 52, High Street, New Oxford Street (facing Tottenham Court Road), will hardly fail to find exactly what they require. As befits the firm which was one of the pioneers in this business, the stock of materials and fittings is most comprehensive and complete, while the range of flying models extends to well over a score. They include monoplanes and biplanes, and in the useful catalogue issued by the company full details are given of each. The catalogue also gives complete information regarding materials, is very thoroughly illustrated, and copies will be sent to any reader applying to the address given above. The model aeroplane department of Messrs. A. E. Jones, Ltd., is now in the capable hands of Mr. William Moss, who is well-known in the aircraft industry.



Lusk, of the R.A.F., senior surviving officer of the crew of seaplane 8695, said that on September 22, 1917, the machine was operating under the direction of the Admiralty, and was under the command of Capt. (then Flight-Lieut.) N. A. Magar.

An enemy submarine was observed in the North Sea and attacked by bombs.

One of the bombs hit the submarine direct, and took effect. The submarine heeled over and sank, and at once, in the disturbance on the surface, were observed air bubbles, an escape of oil, and a large quantity of wreckage.

There were no survivors of the submarine, which was U.B. 72, but her crew had been ascertained to be 32, and prize bounty at the rate of £5 per head of the craft destroyed, totalling £160, was awarded. Capt. Magar was killed in action on April 25, 1918.



## SIDE-WINDS

THOSE who take a pride in the appearance of their aeroplanes or motor cars will be interested in the "Duco" rubber sponge for washing down purposes which Messrs. Brown Brothers, of Great Eastern Street, E.C., have placed upon the market. It is claimed that "Duco" rubber sponges will outlast two or three natural sponges, and will dry off the moisture equally well as, if not better than, a natural sponge. They are British-made and more absorbent than the rubber sponges of foreign manufacture, being made of practically pure rubber. If "Duco" rubber sponges cost three times as much as a natural sponge, they would be cheaper in the end, besides their being easier to use. As a matter of fact, they are made in three sizes, viz., small oval, 2s. 6d.; medium oval, 3s. 9d.; and large round, 7s. 6d.

AMONG the visitors to the Motor Show we were glad to observe Mr. Percy Richardson, until his recent resignation managing director of Sheffield Simplex Motor Works, Ltd., and one of the first owners of an aeroplane in this country. Mr. Richardson is just recovering from a long illness which has kept him from business for several months, and has now left for America in the hope that a sea voyage may complete his convalescence. We trust he may return quite restored to his old form.

ANOTHER invalid who has just made his welcome re-appearance is Mr. Ridley Prentice, who is well-known in connection with the G.A.C., Emaillite, and other prominent firms in the aircraft world. He has had a serious and prolonged illness, and is fortunate to have recovered. His numerous friends will be very glad to see him about once more.

THE statement issued by the Air Ministry on the first six months of civil flying is a remarkable and convincing testimony to the safety of flight. This is the less surprising when one remembers that a large proportion of the civilian passengers took the air in aeroplanes of the type used by the R.A.F. for training pilot cadets, namely the Avro, a machine designed mainly with an eye to safety. Of the 52,000 passengers carried, at least 30,000 made flights in machines belonging to Messrs. A. V. Roe and Co., Ltd., while many of the other air transport companies use Avros for pleasure flying. Next year, of course, an earlier start will be made, and far more extensive operations may be expected. It will not be long before the majority of the people of the United Kingdom will have enjoyed the experience of being up in the air.

WEATHER permitting, the Avro air fleet will visit Bournemouth on Saturday, 6th, and Sunday, 7th, insts. A carnival, or if one may use the expression, an air regatta will be held there on both afternoons, commencing each day at 2 p.m. There will be a sham fight, trick flying, and Miss Nellie Gibson will make her parachute descent. The Avro Baby will take part in the performance, and the latest pattern

limousine will be there to show the last word in comfort and luxury. The arrangements are in the hands of Mr. E. J. Hucks.

A USEFUL accessory to the busy man's desk is thoughtfully provided at an opportune moment by Messrs. C. A. Vandervell and Co. in the shape of a note-block with a few thumb-indexed pages for noting telephone numbers, and not forgetting a pencil which *will* write. Many thanks.

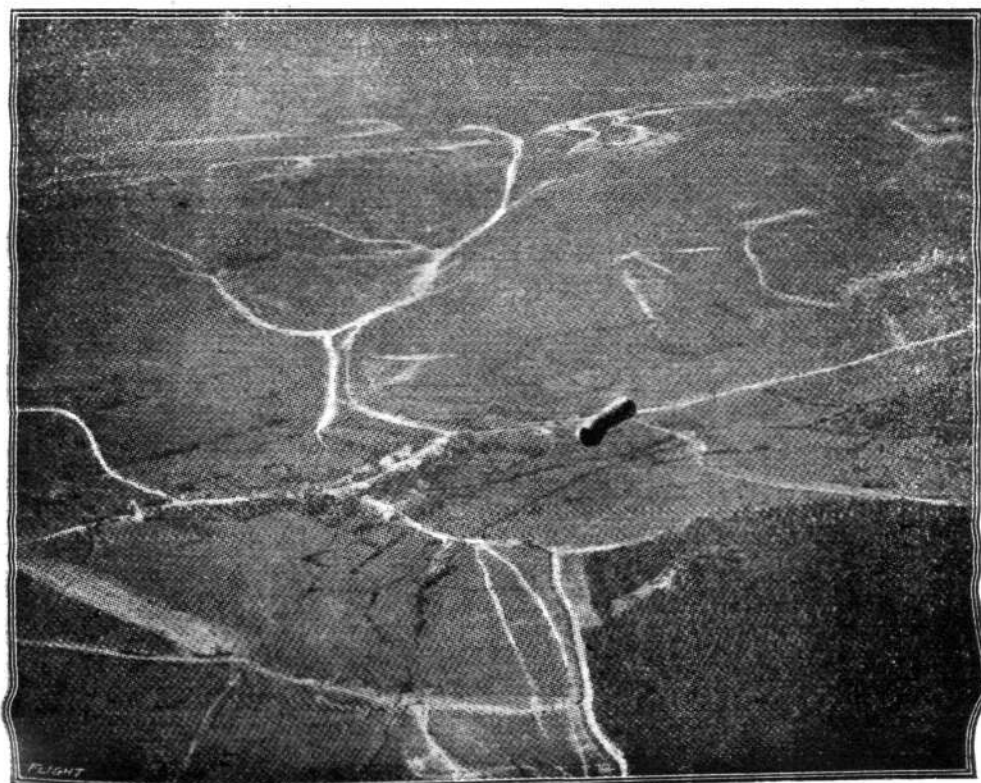
MOTORISTS and motor cyclists throughout Scotland and Ireland will be interested to learn that Messrs. S. Smith and Sons (M.A.), Ltd., the world-famous motor accessory manufacturers, whose head offices are at 179-185, Great Portland Street, London, W. 1, have opened depots and appointed special representatives for both countries. The Scottish depot is situated at 141, Bath Street, Glasgow, and will be in charge of Mr. F. Marshall Milligan. The Irish depot will be controlled by Mr. R. P. Whiteside.

AT both these depots, adequate supplies of the whole of Messrs. Smith's manufactures, which include speedometers, carburettors, starting and lighting systems, electrical and mechanical horns, double-acting jacks, tool-kits, mascots, etc., will be carried, and also stocks of the various lines for which Messrs. S. Smith and Sons (M.A.), Ltd., are sole agents, including M.L. magnetos, K.L.G. plugs, E.U.K. easy starters, Radamax plug-testers, etc.

THE Witton Engineering and Storey Metals Co., Ltd., notify us that they have moved their works from Newtown Row to very much larger and more commodious premises at Wilders Drive, Warwick Road, Greet, Birmingham, where they hope to be able to increase their output of petrol taps, compression taps, hand pumps, cycle pumps and other similar accessories to the motor, electrical, gas and cycle trades.

A VERY artistic pack of playing-cards enclosed in a pocket leather case is to hand from Messrs. W. B. Dick and Co., Ltd., 90, Fenchurch Street, whose name is so familiarly associated with Ilo oil. When you handle this pack it certainly makes you so optimistic as to persuade yourself that you can win every time. Any engineer or firm who would like to possess one of these packs should apply immediately to the address given above, as the demand is sure to be heavy.

FROM one of our friends in the North we hear of an opening for a chief technical assistant, male or female, which will fall vacant at the end of the year. Applicants for the post should have a thorough knowledge of the mathematics necessary for aerodynamic and stress calculations, and should preferably have held a similar position before. We shall be glad to pass on any applications if they are marked "Technical Assistant," c/o Editor, FLIGHT.



An Allied kite balloon "snapped" from a German biplane just before the latter attacked it.

## COMPANY MATTERS

### New Pegamoid, Ltd.

THE report for the year ended September 30, 1919, states that the profit amounts to £11,888, which, with the balance of £5,422 brought forward, makes a total of £17,310, out of which an interim dividend at the rate of 10 per cent. per annum has been paid, leaving a balance available of £15,771. The directors propose to appropriate this as follows:—In payment of a dividend at the rate of 10 per cent. per annum for the half-year ended September 30, 1919, making (with the interim dividend already paid) 10 per cent. for the year, £2,500; in placing to reserve £6,000; in placing to contingency account (including excess profits duty and income tax) £5,000, leaving a balance to be carried forward of £2,271. The directors announce an addition to the board in the person of Mr. J. Walter Bunting, one of the directors of Chamberlins, Ltd., of Norwich.

### NEW COMPANIES REGISTERED

DOVER AIRCRAFT VENTURES, LTD.—Capital £1,000, in 750 ordinary shares of £1 each and 5,000 deferred shares of 1s. each. Objects, to establish and work lines and services of aerial conveyance, carriers of passengers, goods, etc. Solicitor, E. E. Chitty, 19, Castle Street, Dover.

ESSEX AIRCRAFT AND MOTORS, LTD., 90, North Road, Southend-on-Sea.—Capital £5,000, in £1 shares.

KNIGHTS MOTOR AND ENGINEERING CO., LTD., 24, Sherlock Street, Birmingham.—Capital £7,000, in £1 shares. First directors: R. C. P. Knights, V. I. Olliver and C. O. Brettell.

MODERN MOTION, LTD., 93, Old Christchurch Road, Bournemouth.—Capital £1,000, in 800 preferred shares of £1 each and 800 ordinary shares of 5s. each. Dealers in motors, aircraft and their accessories, etc. First directors: G. H. Bettinson and Capt. H. Kirby.

NORTHERN AIRCRAFT TRANSPORT AND TRAVEL CO., LTD., Empire Motor Garage, The Green, Sunderland.—Capital £5,000, in £1 shares. Permanent directors: C. A. Crichton, Flight-Lieut. R. Thornton, F. Woods, F. Fowler, J. Emerson, R. W. Graham, A. Sember and W. Thomas.

JOHN SCOTT AND BRADSHAW, LTD., 9, Boundary Street, Liverpool.—Capital £1,000, in £1 shares. Aeronautical, automobile, and general engineers, etc. First directors: A. Scott, G. W. Bradshaw, Jr., G. W. Bradshaw, Senr., D. Holliday.

### PUBLICATIONS RECEIVED

Manual of Meteorology. Part IV. By Sir Napier Shaw, Sc.D., F.R.S. Cambridge University Press, Fetter Lane, E.C. 4. Price 12s. 6d. net.

The Heart of a Car is the Engine. W. H. Dorman and Co., Ltd., Stafford.

The Press on Dormans of Stafford. W. H. Dorman and Co., Ltd., Stafford.

British Magneto. London: The British Ignition Apparatus Association, 8, Bream's Buildings, E.C. 4.

British Airships: Past, Present and Future. By George Whale. London: John Lane, The Bodley Head. Price 7s. 6d. net.

Report No. 48: Carburetting Conditions Characteristic of Aircraft Engines. Washington, U.S.A.: The National Advisory Committee for Aeronautics.

Report No. 45: Effect of Compression Ratio, Pressure, Temperature and Humidity on Power.

Report No. 53: Properties and Preparation of Ceramic Insulators for Spark Plugs.

Report No. 56: Heat Energy of Various Ignition Sparks. Washington, D.C., U.S.A. The National Advisory Committee for Aeronautics.

Report No. 42. A New Process for the Production of Aircraft Engine Fuels.

Report No. 59. General Analysis of Airplane Radiator Problems. The National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

The Design of Model Aeroplanes. By F. J. Camm. London: Benn Brothers, Ltd., 8, Bouverie Street, E.C. 4. Price 7s. 6d.

Crossley and the Royal Air Force. Crossley Motors, Ltd., Gorton, Manchester.

Meteorology for All. By D. W. Horner. London: Witherby and Co., 326, High Holborn. Price 6s. net.

All About Flying. By Gertrude Bacon. London: Methuen and Co., Ltd. Price 3s. net.

The Royal Aero Club Year Book: 1917-18-19. The Royal Aero Club of the United Kingdom, 3, Clifford Street, W. 1.

Motor-Cycling and Lubrication. C. C. Wakefield and Co., Ltd., Wakefield House, 30-32, Cheapside, E.C. 2.

"Hydra" Tool Steels. Hall and Pickles, Ltd., 64, Port Street, Manchester.

Report No. 49: Metering Characteristics of Carburetors.

Report No. 60: General Discussion of Test Methods for Radiators. The National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

### Catalogues

The B.L.I.C. Magneto. The British Lighting and Ignition Co., Ltd., Cheston Road, Aston, Birmingham.

Palmer Tyres. The Palmer Tyre, Ltd., 119-123, Shaftesbury Avenue, W.C. 2.

### The Sopwith Aviation and Engineering Co., Ltd.

In the case of the Sopwith Aviation and Engineering Co., Ltd., a petition to confirm alteration of the objects of the company, Mr. Justice Astbury sanctioned the alteration on Tuesday. Mr. Micklem, K.C., said that the company was founded in 1913 by the well-known airman, and as the demand for aeroplanes had now fallen off, it was desired to obtain powers to make motor-bicycles and motor vehicles, and to act as coach and carriage builders, and manufacturers of all kinds of furniture.

### AERONAUTICAL SPECIFICATIONS PUBLISHED

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors.

#### APPLIED FOR IN 1916

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published December 4, 1919

16,952. FAIRY AVIATION CO. and C. R. FAIRY. Controlling-devices for aeroplanes. (134,556.)

#### APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published December 4, 1919

- 12,297. J. HIGGINBOTTOM. Air screws. (134,569.)  
12,667. G. GARTMANN. Periscopes for use on aircraft. (134,571.)  
17,965. R. F. POWER. Control of aeroplanes. (134,602.)  
18,064. F. SAGE AND CO. and N. A. T. N. FEARY. Aircraft fabrics. (134,611.)  
18,108. G. E. MORTLEY. Aeronautical dynamos. (134,614.)  
18,333. E. R. CALTHROP. Safety devices for aviators. (134,625.)  
19,087. H. C. WATTS. Propeller blades. (134,642.)  
19,195. N. P. HINTON AND RADIO COMMUNICATION CO. Wireless direction finding. (134,644.)  
19,448. BLACKBURN AEROPLANE AND MOTOR CO., H. BOOTH and G. BEAUMONT. Ribs, spars, etc., for aircraft. (134,652.)  
20,113. M. A. SPENCER. Parachute cases. (134,668.)  
20,689. J. S. WHEELWRIGHT. Apparatus for determining speed and course of aircraft. (134,674.)  
21,623. and 21,624. A. E. AND H. O. SHORT and E. H. MITCHELL. Balloons or airships of rigid type. (134,684 and 134,685.)

#### APPLIED FOR IN 1919

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published November 27, 1919

- 1,168. BOULTON AND PAUL and J. D. NORTH. Aircraft construction. (134,441.)  
1,956. F. H. PAGE and HANDLEY PAGE, LTD. Release gear for bomb dropping, etc. (134,446.)  
9,790. R. S. STEPHEN. Aerial, etc., compasses. (134,483.)  
10,194. W. MURRAY. Propeller shaping machine. (134,762.)  
12,597. A. TEBALDI. Aeroplanes. (128,547.)  
21,078. R. ESNAULT-PELTERIE. Starting devices for I.C. engines. (131,901.)

If you require anything pertaining to aviation, study "FLIGHT's" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xxxv, xxxvi, xxxvii and xxxviii).

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